MARCH 1952

TECHNOLOGY DEPT.

The Paper Industry

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DETROIT

THE Nalco-developed method of identification of slime-forming organisms is the important first step in the Nalco System of *successful* slime control. Nalco experts collect samples at proper points throughout your mill. These samples are analyzed in the Nalco Laboratories, where the finest equipment and scientific skill insure correct reports. Analysis reports provide a firm base upon which to recommend effective, economical slimicide treatment.

Where bacterial conditions change with the seasons, or vary due to local conditions, routine Nalco microbiological analyses detect these changes and point the way to successful year-around slime control.

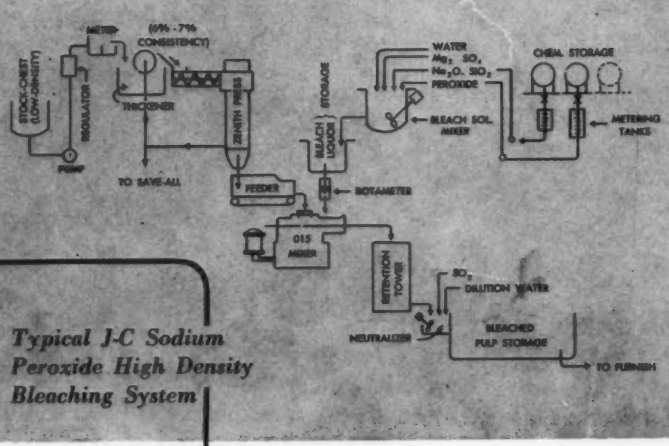
The complete Nalco System, outlined below, can be put to work in your mill on short notice to provide continuing, successful slime control. Write for details today.

The *Nalco* System of Slime Control

- Microbiological Survey.
- Engineering Survey.
- Chemical Survey.
- Selection and application of treatment.
- Regular service calls, routine analyses, and mill checks.

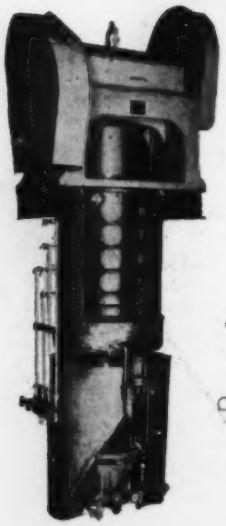
NATIONAL ALUMINATE CORPORATION
6232 W. 66th Place • Chicago 38, Illinois
Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario, Canada

Jackson and Church — HIGH DENSITY SYSTEM



Typical J-C Sodium Peroxide High Density Bleaching System

USES *NO MORE* PEROXIDE TO BLEACH *HIGHER* TONNAGE TO *SAME* BRIGHTNESS OR— *SAME* TONNAGE TO *HIGHER* BRIGHTNESS



*Patents applied for J&C Copyright

J&C Zenith Press designed for use in high density systems, and in pulp washing, de-inking and storage at high density.

The J&C High Density System makes possible bleach consumption savings up to 25%

HERE ARE ADDITIONAL ADVANTAGES:

High density—40% or higher
Continuous operation
Fully automatic operation
Selective pressure control
Product of uniform consistency
Moderate first cost
Extremely rugged construction
Available in corrosion resistant alloys
Low power requirement
Minimum floor space
Aids good housekeeping

For engineering assistance and actual mill performance data, write Dept. D.

JACKSON & CHURCH COMPANY · SAGINAW, MICHIGAN

STOP VALVE CORROSION IN YOUR PIPELINES!

LUNKENHEIMER "Causul"* Metal Valves Resist Acids and Corrosive Fluids

The following are typical of the many acids and corrosive fluids "Causul" Metal Valves handle without corrosion in the valves:

Acetic Anhydride (Pure)
Acetone
Alcohol
Alkalis
Aluminum Sulfate
Ammonia Liquor
Ammonium Sulfide
Ammonium Hydrate
Ammonia-Gaseous
Ammonia-Aqueous
Aniline
Amyl Acetate
Beer
Benzene
Benzol (Containing Sulfur)
Black Liquor
Brines—Acid
Brines—Neutral
Brines—Alkaline
Calcium Chloride (Acid)
Calcium Chloride (Alkaline)
Calcium Hydroxide
Carbolic Acid
Caustic Soda—25% 150°F.
Caustic Soda—50% 150°F.
Caustic Soda—50% 220°F.
Carbon Bisulfide
Carbon Tetrachloride (Plus .5% H Cl)
Chrome Alum
Creosote
Crude Oil
Cyanides
Dye—Black Sulfur
Dye—other (except Chromes)
Edible Oils
Ethyl Acetate
Ethyl Chloride
Fatty Acids (Acidulated)
Fruit Juices
Fuel Oil
Garbage Liquor
Gasoline (Sour)
Glycerine
Hydrogen Peroxide (U.S.P.)
Hydrogen Sulfide
Lime
Mayonnaise
Mercerizing Solutions
Natural Gas (Corrosive)
Oleic Acid
Oxalic Acid
Paper Pulp Mill Liquors
(Soda and Sulfate or Kraft Processes)
Black Liquor
Green Liquor
White Liquor
Phosphoric Acid (Pure)
Potash Alum
Potassium Hydroxide
Pyroligneous Acid
Pickling Acid—complete information required
Producer Gas (corrosive)
Rayon Solutions (except those containing copper salts and acetic acid)
Rosin Oil
Salt (sodium chloride)
Salt Brines
Salty Crude Oils
Sewage
Sludge Acid (Petroleum and Coke By-product)
Soda Ash
Sodium Aluminate
Sodium Bicarbonate
Sodium Carbonate
Sodium Hydroxide
Sodium Silicate
Sodium Sulfide
Sodium Sulfite (neutral or alkaline)
Sour Mash (Distilleries)
Sulfur Chloride
Sulfuric Acid—5% 80°F.
Sulfuric Acid 10% 80°F.
Sulfuric Acid—25% 80°F.
Sulfuric Acid—50% 80°F.
Sulfuric Acid—78% 80°F.
Sulfuric Acid—95% 80°F.
Sulfuric Acid—5% 150°F.
Sulfuric Acid—10% 150°F.
Sulfuric Acid—25% 150°F.
Sulfuric Acid—50% 150°F.
Sulfuric Acid—78% 150°F.
Sulfuric Acid—95% 150°F.
Tankage (highly acid)
Trichlorethylene (solvent)
Turpentine
Turpentine Oil
Water-Alkaline Tap Waters
Zeolite, Permutit, Sodium Aluminate treated waters

*Reg. T/M of The L Co.

Fig. 1639-B and Fig. 1847-A

WRITE FOR Circular 592 which explains "Causul" Metal Valve properties, trims, and typical applications. A confidential information blank is included with the Circular. Just fill it out, return it, and our engineers will recommend the correct "Causul" Metal Valve for any specific service you name. Write The Lunkenheimer Co., Box 360S, Cincinnati 14, Ohio.

IRON • BRONZE • STEEL

LUNKENHEIMER

THE ONE *Great* NAME IN VALVES

We're Building 'Em BIG and We're Building 'Em *Fast*

Things are really humming these days at the Moore & White plant. Complete Fourdrinier and Cylinder machines *have* been built, *are* being built, and *will* be built—as fast as such mechanical mammoths *can* be built.

In the plants of some of the nation's leading paper and board manufacturers, recently built Moore & White machines are now in operation turning out the material needed to meet the zooming demand of business and industry—and doing it with the efficiency that spells profit.

Work in progress in the Moore & White plant today—on the machine tools and on the drawing boards—includes complete paper-making machines for new customers and for customers who have long known that there's no place like Moore & White for getting things done, big or small.

Whatever your need for paper-making machinery, drop your problem in our lap—if you can catch us sitting down long enough for that.

The MOORE & WHITE Company 15TH STREET AND LEHIGH AVENUE • PHILADELPHIA 32, PA.

CUSTOM-BUILT MACHINES FOR PAPER MAKERS

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 33 • NUMBER 12 • MARCH, 1952

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WYANDOTTE
CHEMICALS
Wyandotte Chemicals skilled Technical Service staff is ready to go to work for you in the application of PURECAL M to your coating process, as described here.

Press sheet with Purecal M in coating medium is inspected by Bruce Bivens

How can Wyandotte Purecal M help you sell more offset paper?

Bruce Bivens, lithographer, stresses the importance of whiteness and quick drying in offset printing.

"Every time I'm asked to get a lot of snap in a job, I say, 'Give me a white-white sheet and I'll make it sparkle,' " reports Bruce Bivens, superintendent of the Calvert Lithographing Company, one of the nation's large lithographing plants.

"Of course, that sheet needs a uniform surface. It must also take ink well and dry quickly. I find that many papers which have proved particularly satisfactory on all four counts have PURECAL M in the coating medium."

To paper makers

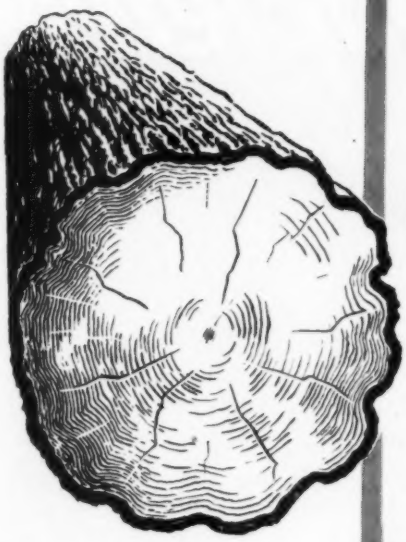
Wyandotte PURECAL* M is a pigment of highest purity for paper coating. It is ultra-uniform in quality and particle size, free of grit and other abrasives, readily and easily dispersed in water. These characteristics insure a uniform, smooth coating of high whiteness and hiding power and maximum production rates.

What to do

If you are using PURECAL M in your coated papers, see that your sales force has these facts as sales ammunition. If you are not using it, write for complete information on its properties and applications. *Wyandotte Chemicals Corporation, Wyandotte, Michigan. Offices in Principal Cities.*

*Trademark

Wyandotte CHEMICALS



How they chew 20-foot logs to chips in 12 seconds

Big 1500 hp E-M SYNCHRONOUS MOTOR *drives 6-knife chipper on back-breaking schedule*

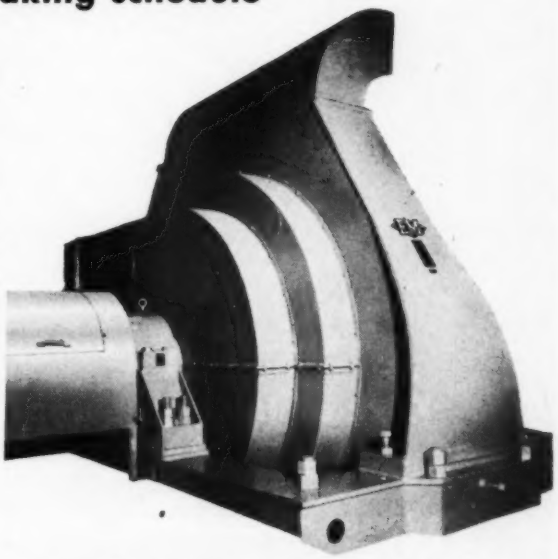
Big logs 30" in diameter become ¾" chips at a rate of 100 feet per minute in the new Columbia Cellulose Co., Ltd. pulp mill. A 153" chipper driven by an E-M Synchronous Motor does the work.

This chipper duty is one of the roughest assignments any motor can get. The 1500 hp, 277 rpm E-M motor is specially designed for momentary output as high as 3750 hp to master the straining impacts and steady hammering of logs hitting the chipper blades.

To keep stray chips and dangerous dirt out of vital motor parts, E-M engineers specified a full enclosure. The protected Synchronous Motor is force ventilated from a screened-off fresh air source. Frame and base of heavy box-type construction and an extra large rotor are specially designed to withstand sudden shocks and strains.

Over years of strenuous chipper operation, constant torque values are maintained in the motor by E-M all-welded cage winding . . . and stout, rigid lashing of coil ends prevents distortion from starting shocks.

These are typical E-M "extras," stemming from imaginative engineering skill and long, practical experience in big motor design. Whether you want a pulp mill drive or power for another use, your nearest E-M sales engineer is a good man to know. Write the factory for *E-M Synchronizer No. 26*, a special issue for the paper industry.



THIS IS THE FULLY ENCLOSED E-M SYNCHRONOUS MOTOR driving the chipper at the new Columbia Cellulose Co., Ltd. pulp mill near Prince Rupert, British Columbia. New mill turns out 200 tons daily of high alpha cellulose.

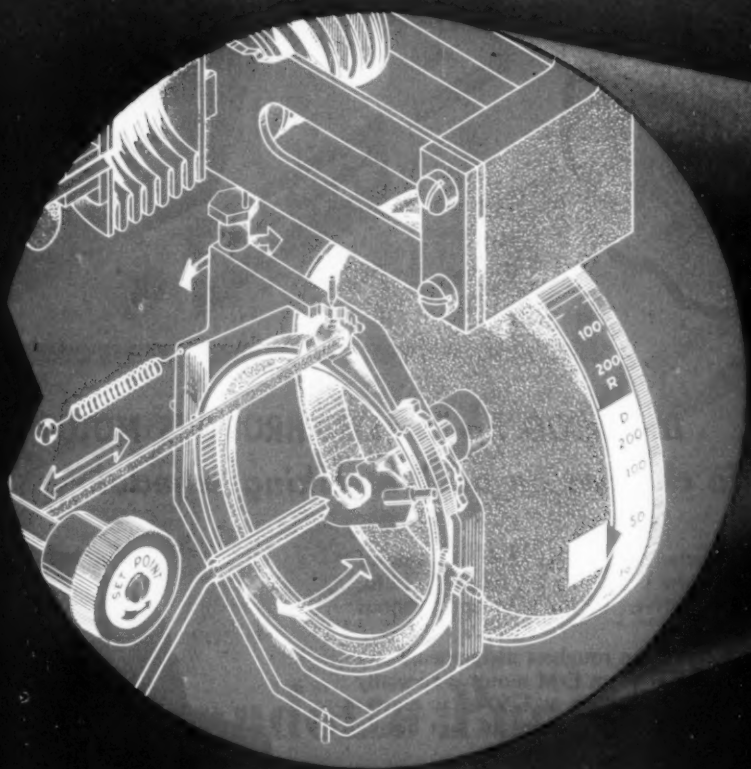
ELECTRIC MACHINERY MFG. COMPANY
MINNEAPOLIS 13, MINNESOTA

1200-TPA-2112

Builders of the best in BIG MOTORS E-M

HERE IS A *Completely*

...with a Mechanism You've Never Seen Before



THE GIMBAL UNIT

Exclusive Advantages!

ONE control mechanism gives you **FOUR** combinations of primary and feedback motion to obtain Direct Proportional, Reverse Proportional, Direct Differential-gap and Reverse-Differential-gap Control.

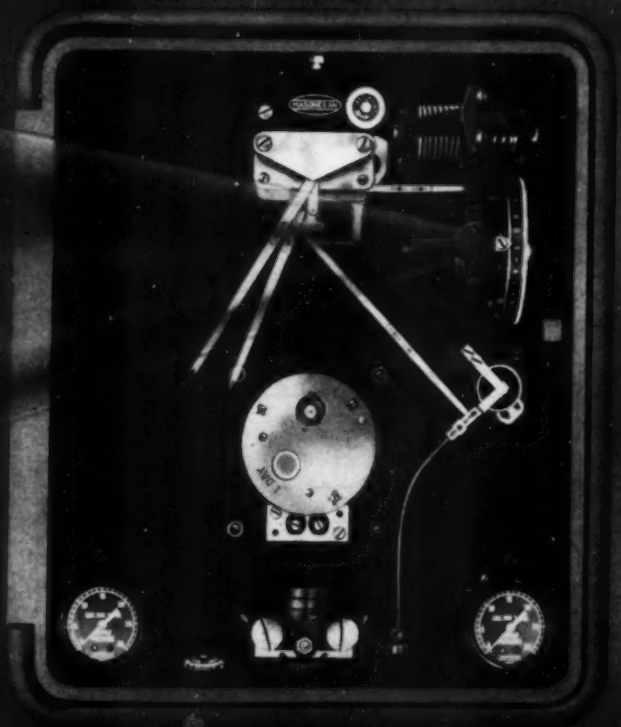
With **ONE SETTING** you select type of control, type of action and proportional band or differential-gap setting.

A HIGH Quality Coefficient PRODUCT

New CONTROLLER

MASONEILAN

60000 SERIES PNEUMATIC CONTROLLERS



MODELS NOW AVAILABLE

Recording and indicating types are now available for pressure, temperature, liquid level or flow service with the following types of control:

Proportional (includes Differential-gap and On-Off)

Proportional-Reset

Plus these supplementary types—

Pneumatic Set — for remote setting of control point

Time Cycle — features cam drive independent of chart drive

Differential—maintains positive or negative differential between two variables — to 50% of chart range.

Also available are Recorders, Transmitters, and Manual Control subpanel with four-position transfer switch.

MASON-NEILAN REGULATOR CO.

1187 ADAMS STREET, BOSTON 24, MASS., U. S. A.

Sales Offices or Distributors in the Following Cities: New York • Syracuse • Chicago • St. Louis Tulsa • Philadelphia • Houston • Pittsburgh • Atlanta • Cleveland • Cincinnati • Detroit San Francisco • Salt Lake City • El Paso • Boise • Albuquerque • Charlotte • Los Angeles • Denver Appleton • Corpus Christi • New Orleans Mason-Neilan Regulator Co., Ltd., Montreal and Toronto

Sulphur

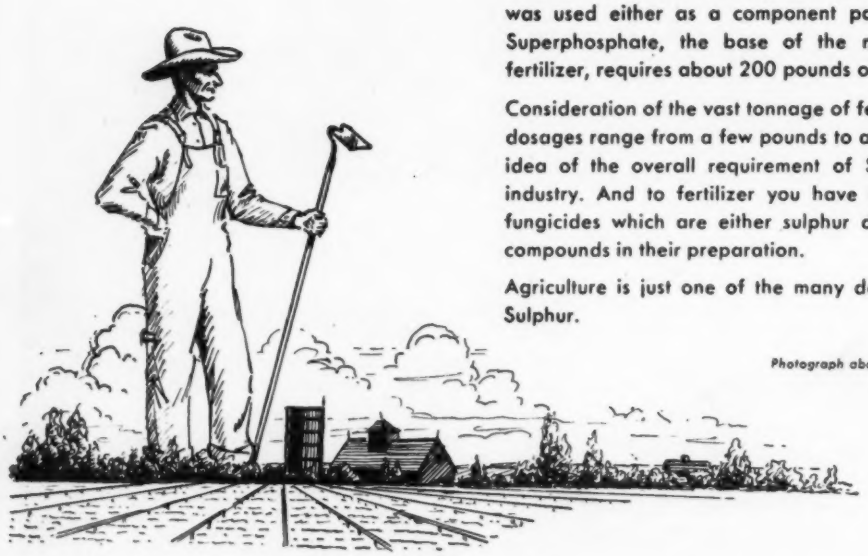
Thousands of tons mined daily, but where does it all go?

THE DEPARTMENT OF AGRICULTURE reports that in 1950 some 336,000,000 acres of land in the United States were under crop cultivation. That's a lot of acreage.

But where, you might ask, is the connection with Sulphur? Fertilizer, to take just one phase of agriculturally-used chemicals in which Sulphur was used either as a component part or as a processing element! Superphosphate, the base of the most widely used manufactured fertilizer, requires about 200 pounds of Sulphur for every ton produced.

Consideration of the vast tonnage of fertilizer used in agriculture — and dosages range from a few pounds to a ton or more per acre — gives an idea of the overall requirement of Sulphur for this one division of industry. And to fertilizer you have to add all the insecticides and fungicides which are either sulphur derivatives or have used sulphur compounds in their preparation.

Agriculture is just one of the many destinations of great tonnages of Sulphur.

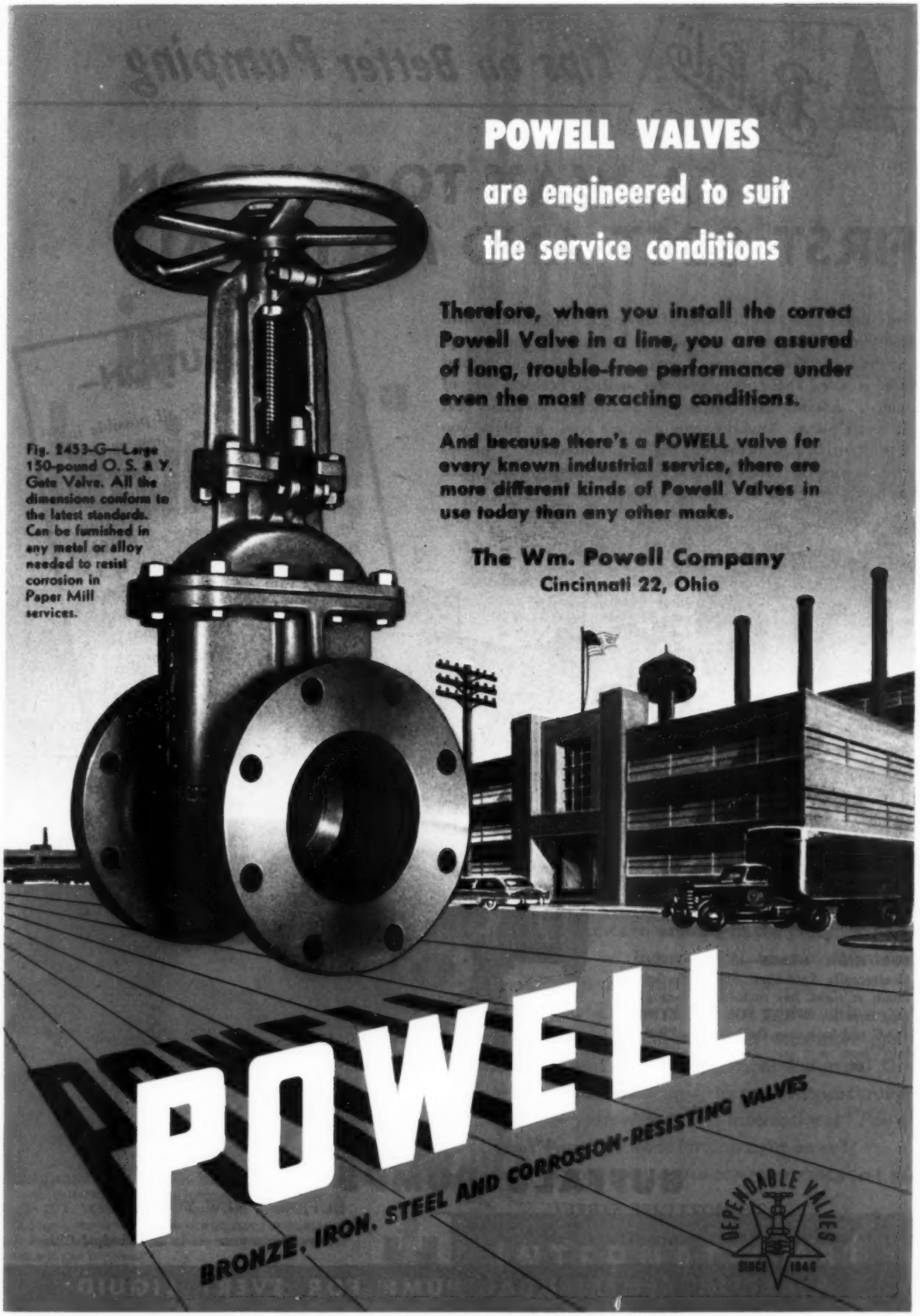


Photograph above shows our loading dock at Galveston, Texas

Texas Gulf Sulphur Co.

75 East 45th Street, New York 17, N. Y.

Mines: Newgulf and Moss Bluff, Texas


POWELL VALVES
are engineered to suit
the service conditions
Therefore, when you install the correct Powell Valve in a line, you are assured of long, trouble-free performance under even the most exacting conditions.
And because there's a POWELL valve for every known industrial service, there are more different kinds of Powell Valves in use today than any other make.
The Wm. Powell Company
Cincinnati 22, Ohio
Fig. 2453-G—Large 150-pound O. S. & Y. Gate Valve. All the dimensions conform to the latest standards. Can be furnished in any metal or alloy needed to resist corrosion in Paper Mill services.
POWELL
BRONZE, IRON, STEEL AND CORROSION-RESISTING VALVES
DEPENDABLE VALVES
SINCE 1846

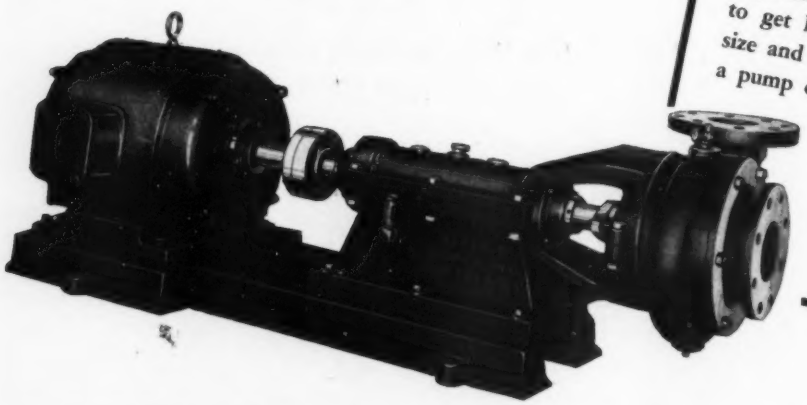
"Buffalo" *Tips on Better Pumping*

A WAY TO SAVE ON FIRST COST AND MATERIALS

Ordering a pump on the basis of having it "big enough with plenty to spare" can result in owning a wastefully large pump. On the other hand, picking a pump to operate at the *highest recommended speed* gives you the smallest practical size of pump . . . saving first cost as well as strategic materials that go into a pump. "Buffalo" engineers are ready to advise you as to the right pumps for your expected conditions . . . pumps with an adequate safety margin, yet of the right size and speed for best service and all-around economy.

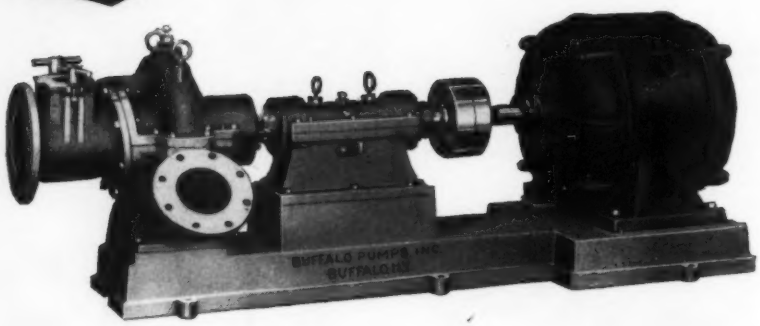
A CAUTION—

It is best to supply all possible information to your pump supplier . . . nature of liquid to be pumped, consistency, temperature, discharge pressure, maximum and operating capacities expected, etc. . . . THEN to get his recommendation as to size and speed. OVERSPEEDING a pump can be as costly or more costly than ordering too large a pump!



One of the wide line of "Buffalo" Pumps, this Solid Shell Full Ball Bearing Pump above, is giving a good account of itself in slurry and other corrosive liquid pumping installations.

FOR HIGH HEADS—this "Buffalo" Horizontally Split-Shell Single Suction Pump at right, has enclosed, non-clogging impeller. WRITE FOR BULLETIN 953-C and look over the complete "Buffalo" line.



"Buffalo"

BUFFALO PUMPS INC.

213 MORTIMER STREET BUFFALO, NEW YORK

Canada Pumps Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

"Best little woods tractor in the business!"

COMING through forest of slash pine near Woodbine, Georgia, is L. B. Proctor's International TD-6. Proctor says, "My TD-6 logs out 40 to 60 trees per hour. Internationals are just right for our operations, and I like mine so well that I've ordered another one."

GOING to the truck pile is an International TD-6 belonging to C. L. McCarthy, Jr., White Oak, Georgia. "Our TD-6 has given us faultless service for many years at very low cost," says McCarthy. "It's the best little woods tractor in the business!"

COMING OR GOING, International power pays off for pulpwood

When it comes to working in the piney, you just can't beat an International tractor. Whatever model you get—diesel or gasoline, crawler or wheel— it will pay off in hard work and low-cost operation, get your quota out with more profit to you. And your International Industrial Distributor will back it up with expert service through the busy years ahead. Put International *"Power that Pays"* to work for you right away!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL HARVESTER

INTERNATIONAL

POWER THAT PAYS

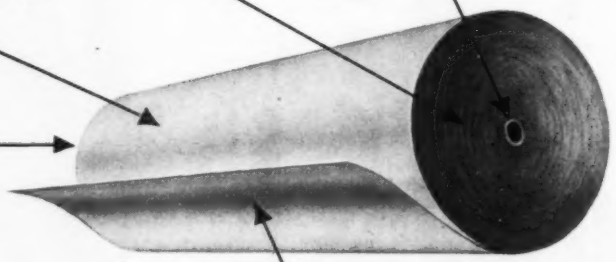
Consider ROLL QUALITY and you'll wind up with *Camachines*®

Uniform density means smooth unwind at top speed. — Automatic counterweighting of the riding roll keeps the rolls uniformly wound throughout.

Straight sides protect the edges in handling. — Precision fitting of the rewind shaft and drums eliminates end play, keeps the web running true.

Tight start and firm core reduce butt spoilage. — Automatic counterweighting and overspeed of the riding roll provide a good, firm start.

Clean cut edges reduce web breaks in subsequent processing. — Air controlled slitter units eliminate guesswork in the slitter pressure, add longer cutting life to the slitter wheels.



Wrinkle free web reduces spoilage. — Longitudinal drum grooving distributes slack section of the web evenly, preventing wrinkles in the rewound rolls. Spiral grooving aids in roll separation.

CAMACHINE 20, pacemaker for the Camachine line of high speed mill type winders. For information request Bulletin 3020.

AA-250

CAMERON MACHINE COMPANY · 61 POPLAR STREET · BROOKLYN 2, N. Y.

The World's First Papermaker in Action

Ts'ai Lun, member of the Imperial Guard of China during the second century after Christ, first conceived the brilliant idea of taking the macerated pulp of tree bark, hemp and old rags . . . pouring it on molds, drying it to make paper. His molds, simply coarse cloth within a wood frame, have been the essential tool in making paper by hand for centuries, as well as the basis for all modern paper machines.

Today, paper making is far more complex and efficient than in Ts'ai Lun's time, and Staley is proud to be a part of this vital industry. Staley makes a full line of high grade starches and dextrin products that mean more efficient mill operation. More and more paper mills rely on Staley for dependable quality raw materials . . . and find it *good business* to do so. Write *today*.

A. E. STALEY MFG. CO., Dept. PI-3, Decatur, Illinois

STALEY

Staley PRODUCTS

Research Pioneers in Products from CORN and SOY BEANS

SIZING STARCHES

Staley makes a full range of starches and dextrins for beater, surface or calender sizing.

COATING ADHESIVES

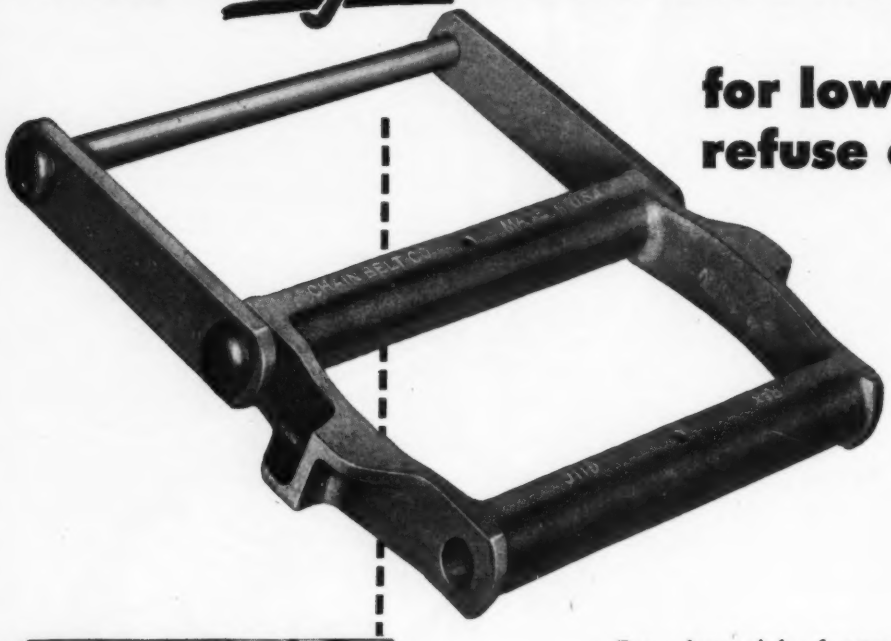
Choose Staley starches and dextrins for machine coating or regular brush coating, with quality first results.

PLASTICIZERS

"Cerelose" and Staley's corn syrup are ideal softening agents for glassine papers.

The Right Combination

for low-cost refuse conveying



Side view, notice the heavy wearing shoes on the edges of the side bars of the *invertible* block link; and the shoe reinforcement, or rib, which also serves to move material. Barrels contain large grease chamber. There is added metal behind the rivet which lengthens chain life.

For a better job of conveying sawdust, refuse, wood chips and similar material, Rex® has developed the new Combination-Type Mill Conveyor Chain No. 6110. It is the ultimate in H-type conveyor chain . . . far superior to the ordinary H-type chain which it is designed to replace.

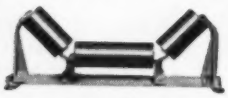
Block links of malleable iron or Rex Z-Metal, and side bars of high carbon steel give this chain the toughness to stand up under long, hard, continuous service. Rivets are specially made to reduce possibility of breakage resulting from momentary overload and corrosion fatigue.

Here's a chain that is sure to slash overall refuse handling costs. It can be run over the same sprockets as ordinary H-type chain. Your Rex Field Sales Engineer is anxious to give you the complete story. Call him today, or if you prefer, write to Chain Belt Company, 4714 W. Greenfield Ave., Milwaukee 1, Wis.

OTHER POPULAR REX MILL EQUIPMENT

Rex H-Type Drive Chain

Rex Chabelco® Chain



Rex Wood Chip Idlers

Baldwin-Rex® Roller Chain

Rex Temperim® Sprockets

CHAIN BELT REX COMPANY ®

Chain Belt COMPANY OF MILWAUKEE

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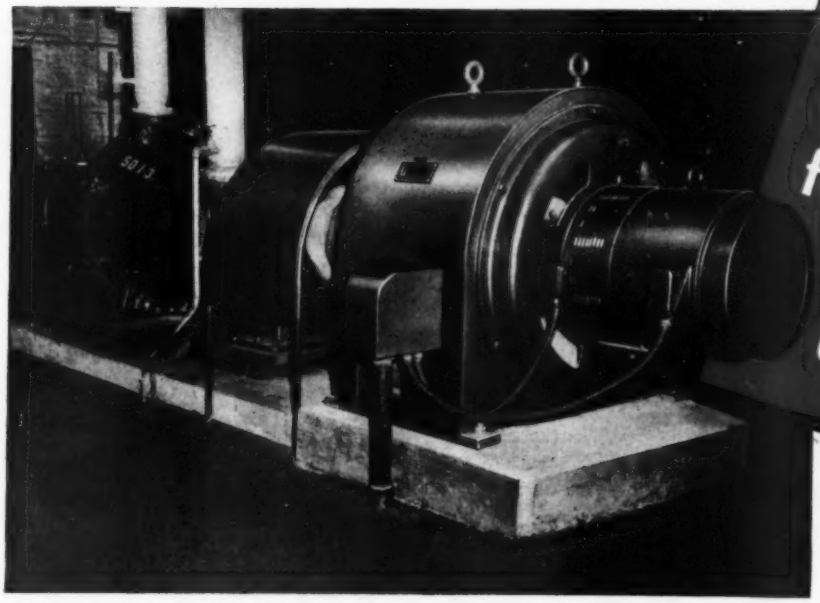
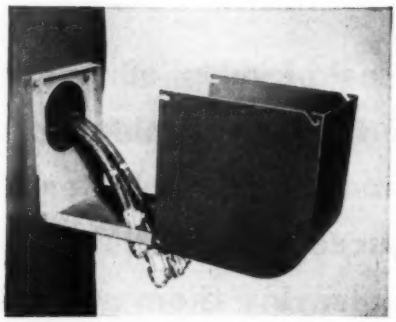
ELLIOTT SYNCHRONOUS MOTORS



a new high in dependability for pulp and paper mill drives—

Bracket type Elliott Fabri-Steel synchronous motor driving Jordan.

Whether you need synchronous, squirrel-cage, wound rotor, or direct current motor drive,



Large, easily accessible conduit boxes are standard on all Elliott motors. Drip-proof box above plus long leads and clamp-on type connectors make connections a simple task, and provide adequate protection. Splashproof type conduit boxes also available, providing same ample size and ease of accessibility.

Select ELLIOTT—because

- **Long established reputation**—manufacturers of dependable motors and generators for over half a century.
- **Pioneering achievement**—many outstanding features in motors today originated in Elliott Engineering Department.
- **Advanced engineering** — completely re-designed line of motors and generators since World War II. The new FABRI-STEEL design provides:

New bumpproof strength . . . Rigid, light bearing brackets . . . Ease of accessibility . . . Improved ventilation . . . Reduced maintenance cost. Write for descriptive bulletins.

Elliott FABRI-STEEL MOTORS AND GENERATORS

L-81E

ELLIOTT COMPANY

Dept. PI

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MORE MILLS USE
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actual facts—not claims—prove t*

superiority of this

Day after day, from scores of mills all over the country, come reports of the remarkable dollars-and-cents savings being made by Pexol, Hercules' fortified size. Actual figures from satisfied customers prove that Pexol is saving them millions of dollars a year.

Is it any wonder that paper and board mills use more Pexol than all other fortified sizes combined?

Buy your fortified size from the leading supplier

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er for leadership...

EPEXOL† THAN ALL

DSIZES COMBINED

ve the unbeatable economy and

is new fortified size

of papermaking chemicals *and be sure* you get your share of these tremendous savings.

Hercules distribution on all its products is nation-wide, and its complete technical staff is at your service anywhere, any time.

HERCULES POWDER COMPANY
INCORPORATED

Paper Makers Chemical Department, 916 King St., Wilmington 99, Delaware

SIZING MATERIALS AND CHEMICALS FOR PAPER

†HERCULES TRADE MARK

ne industry millions of dollars a year

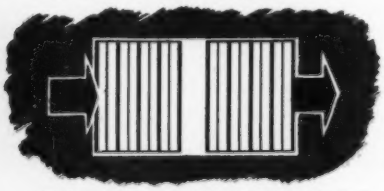
PP52-2

These 10 BIG Features Make Western Precipitation COTTRELLS Outstanding in the Paper Industry

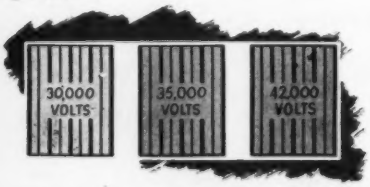
When considering COTTRELL Equipment for salt cake recovery, or any other application in the paper industry, remember this . . . *Western Precipitation Corporation not only pioneered the first commercial application of* COTTRELL *equipment made in any industry, but also pioneered the first application of* COTTRELL *equipment in the paper industry.*

Among the vitally important advantages found in Western Precipitation COTTRELLS, the following are particularly important in paper mill installations ...

1 **Sustained Year-After-Year Efficiency:** The recovery efficiency of Western Precipitation COTTRELLS does not fall off in service. All parts are of ample design to maintain guaranteed over-all efficiency year-after-year —not for just a single acceptance run.



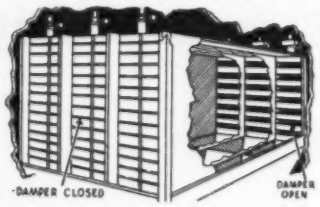
2 **Higher Recovery:** The horizontal flow design of Western Precipitation COTTRELLS eliminates collected material falling countercurrent to incoming gas stream This assures higher recovery, minimum resuspension of recovered material in gas stream.



3 **Maximum Performance:** Horizontal flow of Western Precipitation COTTRELLS permits use of multiple electrical sections so that voltage in each section can be varied to dust loading for maximum recovery without arc-over or electrical breakdowns.

4 **Lower Over-all Cost:** When comparing COTTRELL costs, be sure to compare total *installed* cost, including duct work.

5 **Simpler Maintenance:** Because all interior parts and electrode systems are readily accessible, Western Precipitation COTTRELLS are far easier to maintain and service. Saves "down" time, saves repair costs.



6 **Greater Adaptability:** Horizontal flow design permits use of multi-vane dampers in multiple-unit installations. Thus, one unit can be shut off completely to permit maintenance operations without closing down entire Precipitator. Also, the dampers can be used in slightly-closed position to assure more uniform gas distribution.
On single-unit installations, chain curtains assure uniform distribution of gases. Curtains are easily kept clean by shaker mechanisms provided.

7 **"V"-Shaped Hoppers:** Horizontal design permits use of continuous "V"-shaped hoppers for collecting recovered material. Steeply-sloped walls in this type of hopper prevent build-up or bridging of recovered material.

8 **Space-Saving Compactness:** Not only do their horizontal design permit maximum compactness in Western Precipitation COTTRELLS, but various sections of a unit can be arranged for indoor installation in space above cascade evaporators, thus utilizing space otherwise wasted.

9 **All-Weather Construction:** Western Precipitation COTTRELLS are built for both indoor or outdoor installation, and this organization has had extensive experience with special construction to prevent excessive corrosion in rigorous northern climates.

10 **More Extensive Experience:** Since pioneering the commercial application of COTTRELL Precipitators over 42 years ago, Western Precipitation has consistently led in developing one unique advancement after another. Such features as 4-Point Electrode Suspension that eliminates misalignment of electrodes and reduction in recovery efficiencies . . . Unusually Rugged Rapper Design that assures proper cleaning of electrodes . . Extensive Experience with all types of electrode designs . and many other advantages assure you the ultimate in COTTRELL design and efficiency when you bring your recovery problems to Western Precipitation engineers.

Without obligation our nearest representative will gladly make Western Precipitation COTTRELL *experience available to you for solving your particular recovery problem. Why not contact him today?*

IMPORTANT! In addition to COTTRELL *Electrical* Recovery equipment, Western Precipitation Corporation also designs and installs the well-known MULTICLONE *Mechanical* Collectors for hogged-fuel fired boilers. These units are unusually compact, highly efficient and can be readily fitted into existing plants at minimum installation costs. *Write for details!*

Send for Helpful Literature

WESTERN Precipitation CORPORATION

ENGINEERS, DESIGNERS & MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

Main Offices: 1037 WEST NINTH STREET, LOS ANGELES 15, CALIFORNIA
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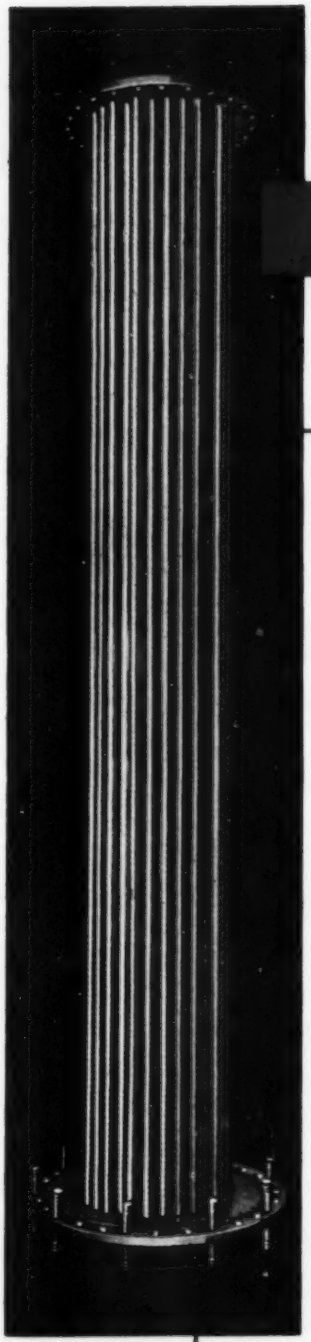
PRECIPITATION CO. OF CANADA, LTD., DOMINION SQ. BLDG., MONTREAL



B&W Stainless Tube bundle for heater in sulphite mill

let's take a CLOSER LOOK at TUBING SERVICE CONDITIONS

Because corrosive, abrasive, and temperature conditions in pulp and paper making processes range from mild to severe, matching tubes to jobs is imperative for optimum cost-life ratio.

If you are undecided as to whether you are expecting too much or too little from present tubing applications, consult Mr. Tubes—your B&W Tube Representative. Chances are he can give you valuable assistance on your requirements in the light of today's critical materials situation.

Send for Bulletin TB-328 containing properties, applications, fabricating data, and other information on these . . .

B&W SEAMLESS and WELDED TUBES for Pulp and Paper Mills

Carbon Steel—Used where service conditions are mild, that is, where the temperatures involved are relatively low and corrosive attack is not anticipated.

B&W Nicloy 3½, B&W Nicloy 5—Nickel Alloy Steels (Seamless only)—For resistance to alkaline corrosion.

B&W Croloy 18-8s (Type 304)—versatile and widely used grade. Its resistance to many kinds of corrosion, its oxidation resistance, and ease of handling, are some of the properties that make this steel an economical choice for many stainless installations.

B&W Croloy 16-13-3 (Type 316), B&W Croloy 18-13-3 (Type 317)—Extensively used because of their high corrosion-resisting properties, unusually high strength at elevated temperatures, and excellent resistance to oxidation. Type 317, having an increased chromium and molybdenum content, offers additional corrosion resistance.

B&W Croloy 18 (Type 430)—This "straight chromium" stainless steel is resistant to both corrosion and oxidation and is one of the most widely used of the ferritic grades. It is not susceptible to intergranular corrosion and is relatively free from pitting corrosion. It is particularly resistant to alkaline solutions, and is excellent in nitric acid and nitrating solutions. It is ductile and easily formed.

In addition to the grades listed above, B&W makes seamless and welded tubing in a wide range of other stainless and alloy steels.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION

General Offices & Plants
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
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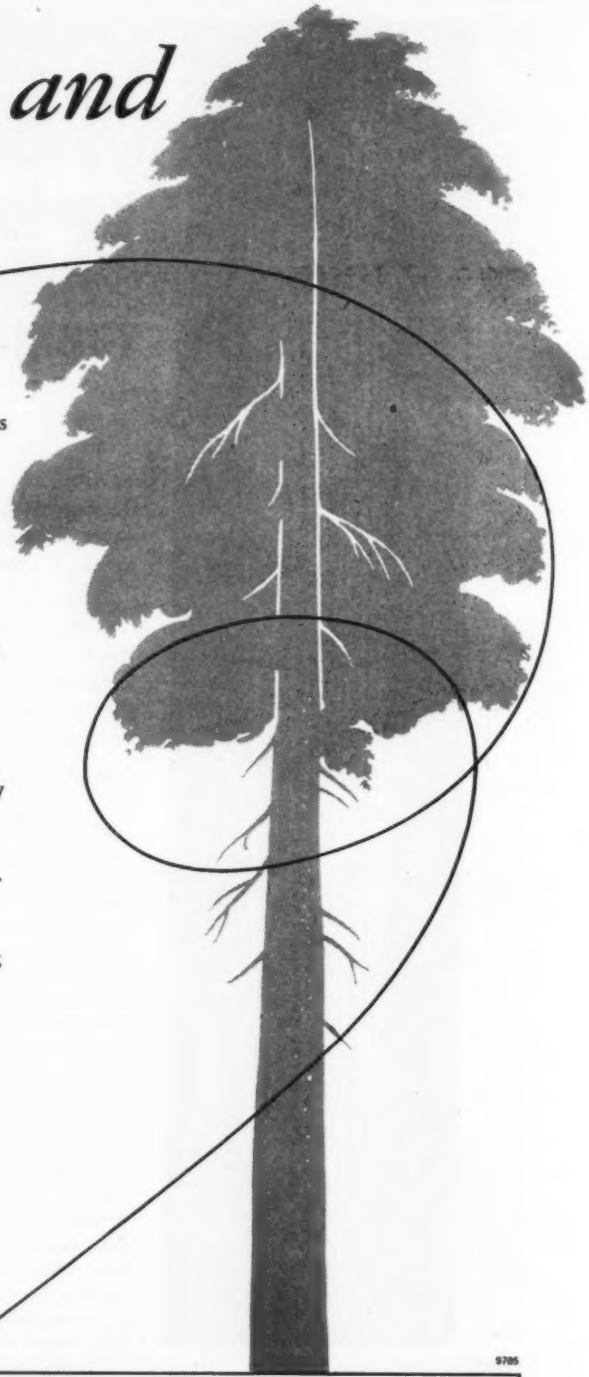
Sales Offices: Beaver Falls, Pa. • Boston 16, Mass. • Chicago 3, Ill. • Cleveland 14, Ohio • Denver 1, Colo. Detroit 26, Mich. • Houston 2, Texas • Los Angeles 17, Calif. • New York 16, N. Y. • Philadelphia 2, Pa. • St. Louis 1, Mo. • San Francisco 3, Calif. • Syracuse 2, N. Y. • Toronto, Ontario • Tulsa 3, Okla.

B&W SEAMLESS and WELDED TUBES

TA-1646-5

white, bright and easy to read



Improve legibility, minimize show-through in your coated stocks with Titanox pigments. Vital to the appearance of fine printed material, Titanox pigments enable you to produce coatings of increased brightness and opacity — or if desired, maintain constant brightness with greatly increased opacity.

Two types of Titanox pigments contribute to the improvement of coatings. TITANOX-A-WD is recommended where exceptionally high opacity is required in light weight coatings. Where heavier coating is desired, or the full power of pure titanium dioxide is not needed, TITANOX-RCHT, a rutile-calcium pigment, is effective and most economical. Often, a combination of both types of pigment proves to be the best choice. Each pigment, because of its fine particle size, disperses easily and uniformly in the coating mix.

In choosing the Titanox pigment best suited to your needs, consult our Technical Service Department... ask your Titanox representative or write Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; Boston 6; Chicago 3; Cleveland 15; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 9, Ore.; San Francisco 7.
In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

9705

TITANOX

the brightest name in pigments

TITANIUM PIGMENT CORPORATION

Subsidiary of **NATIONAL LEAD COMPANY**

MARX SAVEALL

for the Efficient Recovery of Wood Fibers from Waste White Water

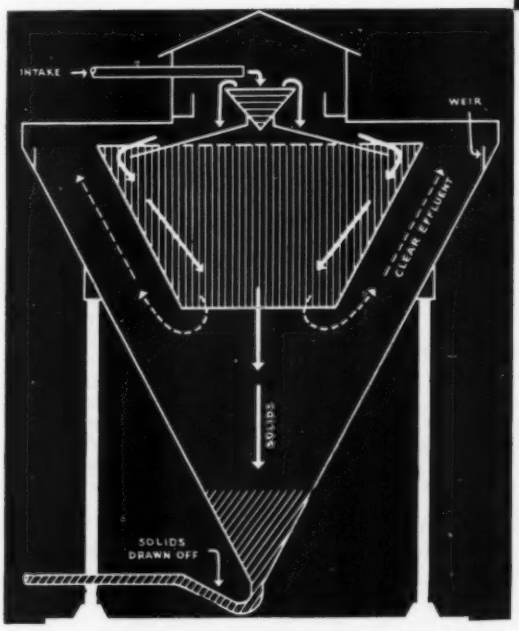


Diagram of the Marx Saveall and how it operates to save you money.

Cut your cost of operation by recovering *lost* wood fibers from waste white water. That's what a large Texas producer of paperboard did . . . and it paid off $18 a ton.

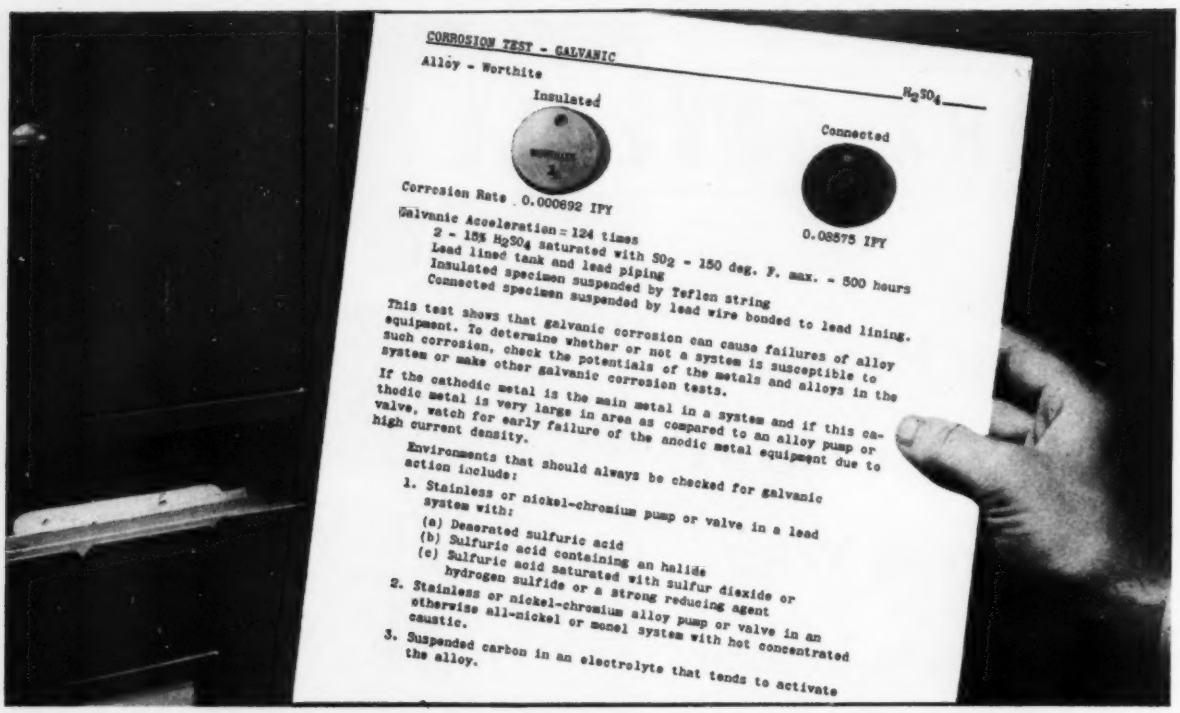
Behind the story of more profitable operation is a Marx Saveall built by the Chicago Bridge & Iron Company. This welded steel structure consists primarily of two large cones made of plate steel . . . one mounted inside the other. White water from the paperboard machine is fed into the receiving well at the top of the unit. It then overflows on to a deaeration plate where air bubbles are shaken loose from the solid particles. Suspended fibers settle through the inside cone and collect at the bottom of the outside cone. Clear water rising between the two cones overflows a circular weir into a draw-off channel. The settled solids are drawn off through a pipe at the bottom of the outside cone.

Reduce your operating costs by this efficient recovery method. Write our nearest office for more complete information about the Marx Saveall or other Horton structures for the pulp and paper industry. We also build digesters, accumulators, pulp washing tanks, blow tanks, seat tanks, and elevated water tanks to meet your specific requirements.

CHICAGO BRIDGE & IRON COMPANY

Atlanta, 3.....2143 Healey Building
Birmingham, 1.....1511 North 50th Street
Boston, 10.....1026—201 Devonshire Street
Chicago, 4.....2445 McCormick Building
Cleveland, 15.....2267 Guildhall Building
Detroit, 26.....1566 Lafayette Building
Havana.....402 Abreu Building
Houston, 2.....2143 C & I Life Building
Los Angeles, 17.....1559 General Petroleum Building
New York, 6.....3350—165 Broadway Building
Philadelphia, 3.....1653—1700 Walnut Street Building
San Francisco, 4.....1547—200 Bush Street
Seattle, 1.....1327 Henry Building
Tulsa, 3.....1651 Hunt Building
Washington 6, D.C.....1138 Cafritz Building

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.


CORROSION TEST - GALVANIC
Alloy - Worthite
H_2SO_4
Insulated
Connected
Corrosion Rate 0.000892 IPY
0.08575 IPY
Galvanic Acceleration = 124 times
2 - 15% H_2SO_4 saturated with SO_2 - 150 deg. F. max. - 500 hours
Lead lined tank and lead piping
Insulated specimen suspended by Teflon string
Connected specimen suspended by lead wire bonded to lead lining.
This test shows that galvanic corrosion can cause failures of alloy equipment. To determine whether or not a system is susceptible to such corrosion, check the potentials of the metals and alloys in the system or make other galvanic corrosion tests.
If the cathodic metal is the main metal in a system and if this cathodic metal is very large in area as compared to an alloy pump or valve, watch for early failure of the anodic metal equipment due to high current density.
Environments that should always be checked for galvanic action include:
1. Stainless or nickel-chromium pump or valve in a lead system with:
(a) Deaerated sulfuric acid
(b) Sulfuric acid containing an halide
(c) Sulfuric acid saturated with sulfur dioxide or hydrogen sulfide or a strong reducing agent
2. Stainless or nickel-chromium alloy pump or valve in an otherwise all-nickel or monel system with hot concentrated caustic.
3. Suspended carbon in an electrolyte that tends to activate the alloy.

A CASE STUDY FROM THE WORTHINGTON FILES. This Worthington test sheet indicates that the galvanic action could be virtually eliminated in this manufacturer's system by *insulation*—that is, a complete separation of the alloy pump from metallic contact with lead surfaces. The recommendation was made to him as a result of a Worthington test made on the solutions his system was pumping.

It Takes More Than A Pump To Solve A Pumping Problem!

Worthington's files are packed with many stories like this one. Each is proof positive that you get a lot more than a Worthite* pump when you buy from Worthington.

It was the age-old problem of chemical pumping, corrosion. But this customer found a way out—a *practical solution* that saved him plenty of expense in extra maintenance and lost production time.

He wrote a letter to Worthington. Could we tell him whether there was anything he could do to slow down or stop this corrosion? He was pumping a 15% solution of sulfuric acid saturated with sulfur dioxide. Maximum temperature of solution was 150° F.

This wasn't a new problem for Worthington corrosion specialists. Experience had shown them that under these conditions galvanic action could be his trouble. They ran the test illustrated above which conclusively proved these assumptions correct.

Result? The customer insulated the system and his troublesome corrosion problem was brought under control.

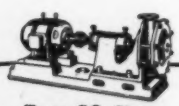
At Worthington, we welcome the chance to hear about *your* pumping problems—either on a present installation or in the design of a new system. For it is only through such close contact with the industry that we can continue to build the kind of pumps and offer the kind of services that have led pump users the world over to the conclusion that *there's more worth in Worthington.*

Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, New Jersey.

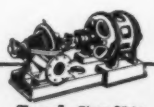
*Reg. U. S. Pat. Off. C.1.6

Types CG and CGL. Sizes ¼" to 10". Capacities to 5000 GPM; heads to 200 ft. Liquid ends of WORTHITE.

Type CF. Sizes 1" to 4". Capacities to 1000 GPM; heads to 130 ft. Standard, all iron and all bronze.



Type CQ. Sizes 1½" to 3". Capacities to 600 GPM; heads to 130 ft. at 1750 RPM. Closed impeller.

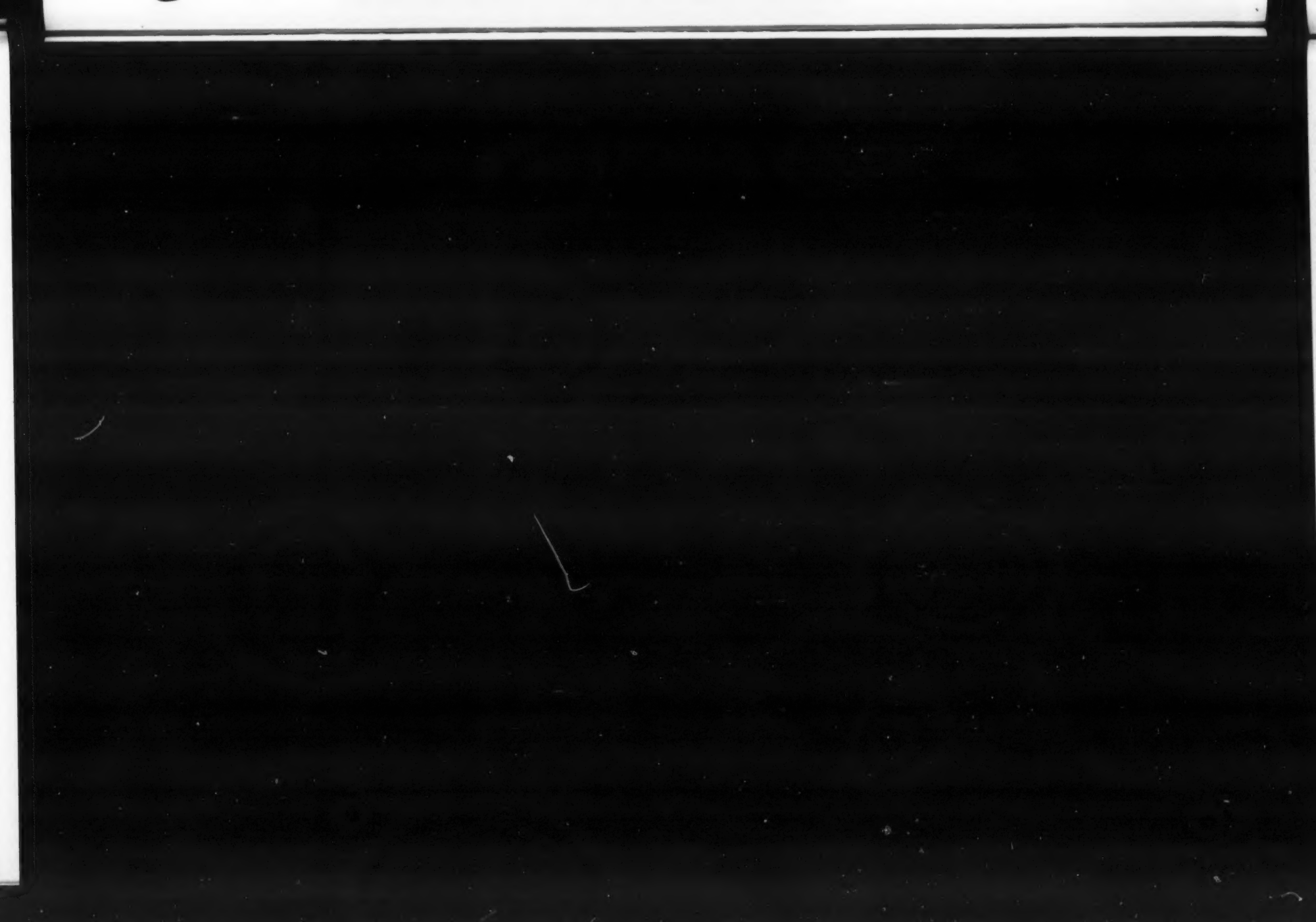


Type L. Sizes 3" to 8". Capacities to 2250 GPM; heads to 300 ft. Single stage volute. For general service.

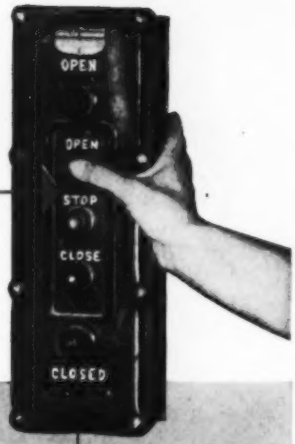
WORTHINGTON

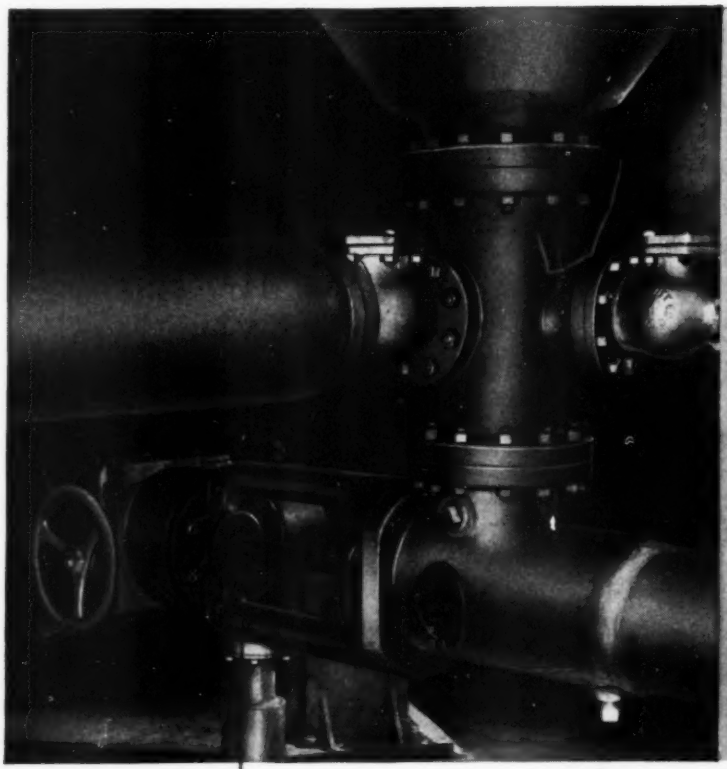
Centrifugal Pumps

The World's Broadest Line Assures You the Right Pump for Every Job



easy way to blow down pulp digesters





Press a button. ***That's all there is to it.***

You don't even have to go down to the discharge floor; the button can be conveniently located right on the operating level.

That's one of several reasons why Yarway Remote-Controlled, Motor-Operated, Digester Blow Valves have become standard equipment on pulp digesters in many leading plants—*names on request.*

One of eight Yarway Digester Blow Valves installed at a Canadian paper mill.

OTHER REASONS:

1. **The famous Yarway non-clog *seatless* operating principle that assures tightness and effectively seals off the digester, preventing loss of black liquor and increasing the number of cooks per day.**
2. **Yarway's rugged construction withstands severe shock.**
3. **Yarway's modern metallurgy withstands severe chemical action.**
4. **Fast operation results from motor control and self-cleaning free discharge.**

If you are interested in increased production, low maintenance, savings in labor—then you're interested in Yarway Digester Blow Valves. Write for full description and specifications in Yarway Bulletin B-440.

YARNALL-WARING COMPANY

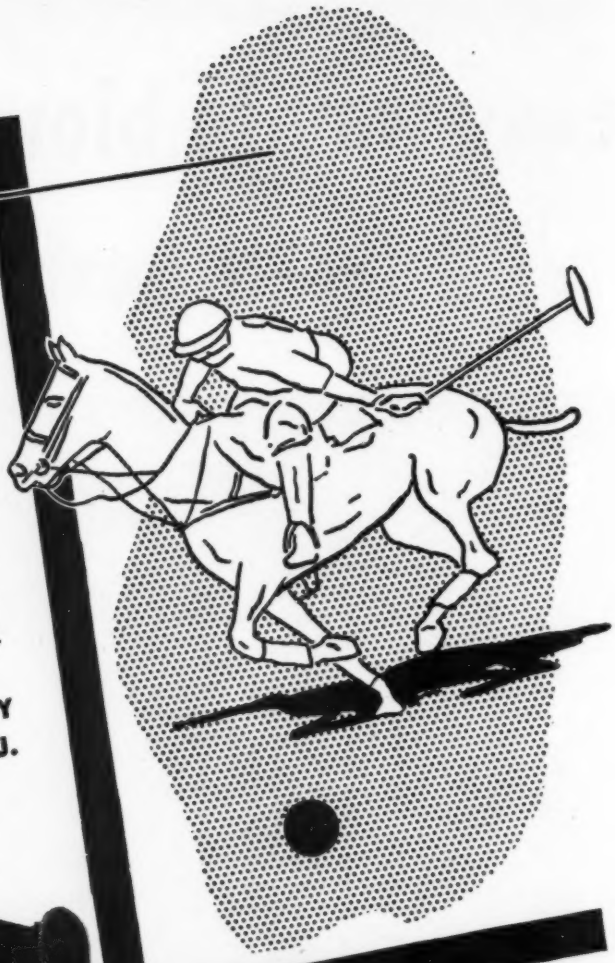
149 Mermaid Ave., Phila. 18, Pa. • Branch offices in Principal Cities

YARWAY

Performance

All Langston Slitters and Winders are noted for exceptional performance with low maintenance costs. Here's Type "CA"—ideal for many Winder or Rewinder jobs, from 62" to 122". It can be built to operate at speeds up to 3000 f.p.m. and to handle rolls up to 60" in diameter or, on special order, 72".

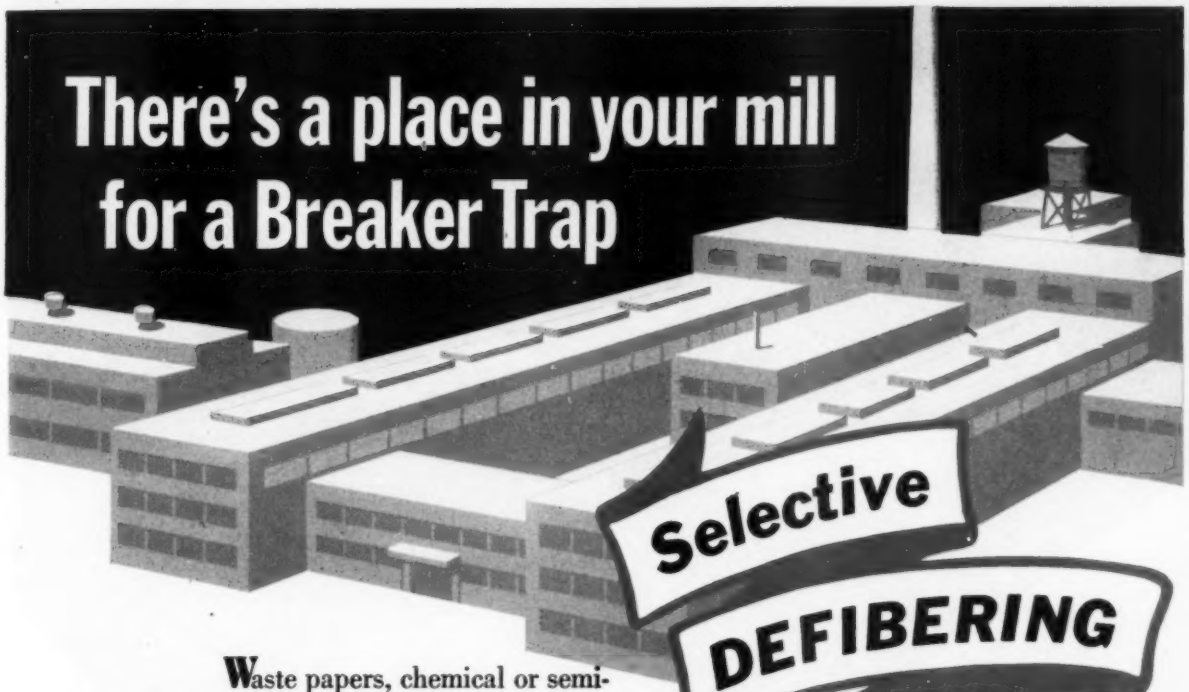
SAMUEL M. LANGSTON COMPANY
CAMDEN, N. J.



Langston

slitters and winders

There's a place in your mill for a Breaker Trap



Selective DEFIBERING your stock

Waste papers, chemical or semi-chemical pulps . . . all can be defibered with a minimum of power by the rugged Sutherland Breaker Trap. Its action is selective, too. Thus oversize fiber bundles are broken down, while hard lumps of dirt, rubber bands, etc., are left whole so that they can be rejected by conventional screening methods. At the same time, tramp metal is effectively removed by centrifugal action.

Your mill probably has one or more jobs that can be done better with less power by a Sutherland Breaker Trap. Investigate its possibilities today.

Write or wire for our new descriptive folder.

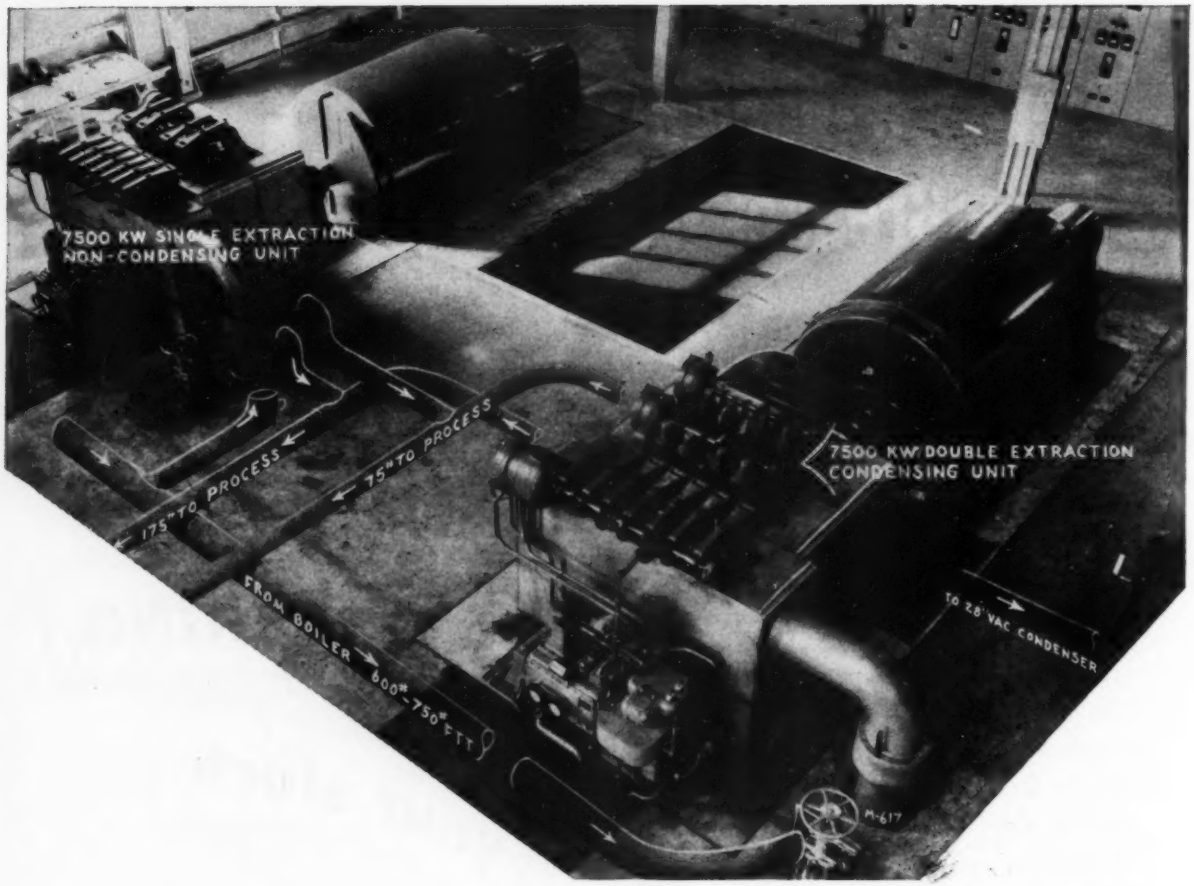
SUTHERLAND

Patent pending

Breaker Trap

SUTHERLAND REFINER CORPORATION

TRENTON 8, N. J.



Process Steam Maintained at 2 Pressures

by Worthington Turbine Generators

This is how Worthington and a Far West cellulose mill set up the steam supply for utmost efficiency and flexibility.

We combined a non-condensing single automatic extraction unit with a condensing double automatic extraction unit. The 7500-kw units operate in parallel and, in addition to supplying plant power, furnish steam at two pressures for process requirements.

Along with the advantages of efficient operation and low cost and ability to adjust to mill requirements, this mill benefits from the manufacturer's *unit responsibility*. In this case, Worthington also furnished two 470-hp turbines to drive boiler feed pumps, two 452-hp turbines to drive induced-draft fans, two 146-hp turbines to drive forced-draft fans, and one 50-kw turbine-driven exciter set.

If you want proof *there's more worth in Worthington*, write Worthington Pump and Machinery Corporation, Steam Turbine Division, Wellsville, New York.

T.2.6

A GREAT TEAM IN STEAM

WORTHINGTON

Steam Turbine Generators

THE *RIGHT*
DRYER FELT

**Hooperwood Dryer Felts—
Cotton or Asbestos—are engineered
for the job they have to do.**

**Whether the product is kraft, writing,
newsprint, linerboard, book, or a specialty,
there's a Hooperwood Dryer Felt
made just for that job.**

**Write William E. Hooper & Sons Company
Juniper and Cherry Streets, Philadelphia 7, Pa.**

MILLS: WOODBERRY, BALTIMORE, MD.

HOOPERWOOD
DRYER FELTS

BIG
PULPSTONES
. . . OR LITTLE ONES

Norton Can Furnish You with Exactly The Right Stone for Your Needs

Whether your grinders are husky 5000 horsepower jobs that take giant stones like the world's largest above, or smaller 100 h. p. grinders that take stones like the 40" diameter at the right, you can be sure that Norton can furnish a stone that's *exactly* right.

And it will not only be right in size but also in the type of abrasive and the grit size and spacing to produce from your wood the exact kind of pulp that you require.

What's more, Norton engineering service is available to help you select the right stone specifications to meet conditions in your mill.

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Making better products to make other products better

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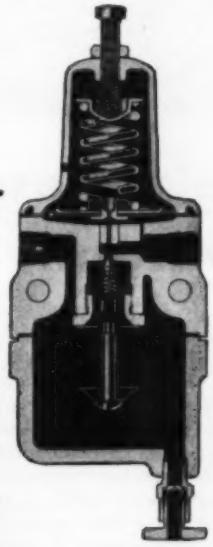
Nationwide Swing to

FISHER® SERIES 67
SMALL VOLUME REGULATORS

FISHER TYPE 67

exterior view, with hand-wheel adjusting screw. Also available as Type 67P for panel mounting.



FISHER TYPE 67FR

combination filter regulator. Finest filter perforation area-0.002".

AN ALL-PURPOSE REGULATOR PARTICULARLY ADAPTED AS AN AUXILIARY OPERATING MEDIUM PRESSURE REGULATOR

- **ACCURATE, EFFICIENT REGULATION**
- **TIGHT CLOSURE**
- **WILL NOT CHATTER, VIBRATE OR SING**
- **NEAT DESIGN**

Fisher Series 67 Regulators have won universal acceptance for small volume air or gas flows. They are ideal for hundreds of industrial applications and are particularly adapted to instrument air service, supplying 20 lbs. operating medium pressure to pilot operated regulators. Capacity up to 6 C.F.M. For further details and complete specifications, write for Fisher Bulletin 67, **Fisher Governor Company, Marshalltown, Iowa.**

FISHER

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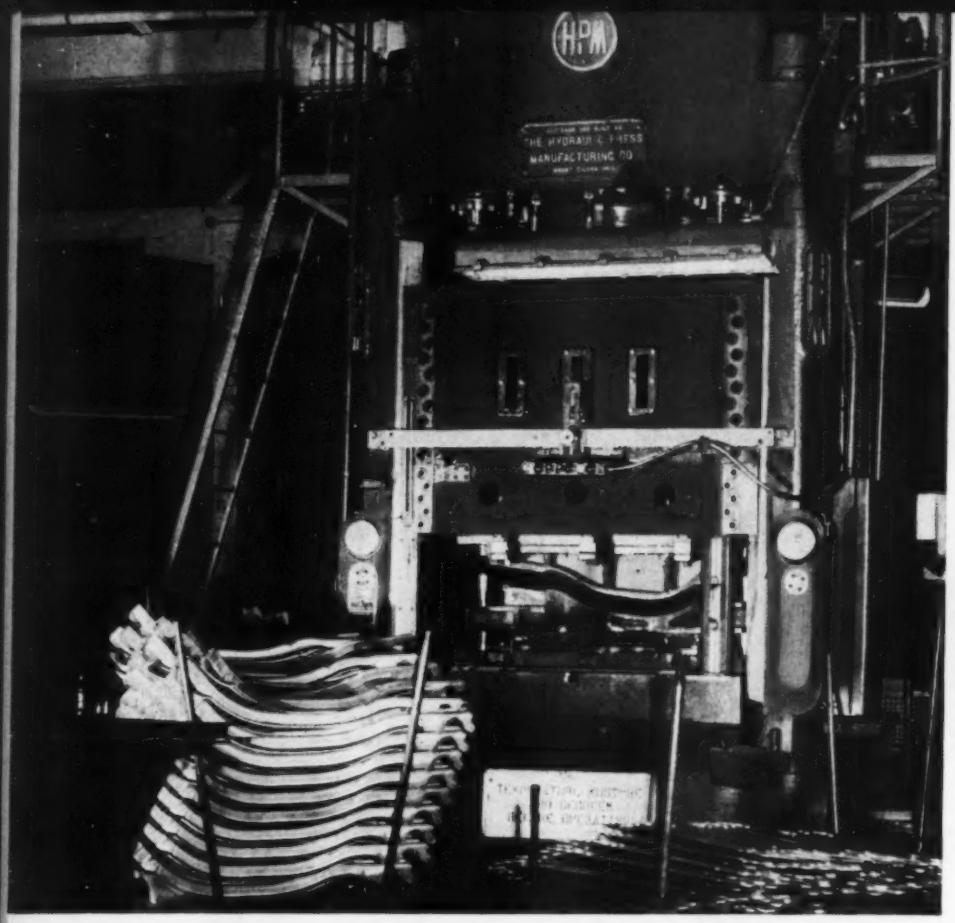

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THE BIG 400-ton hydraulic press shown above is used to stamp out parts for farm machinery in a big midwest plant.

When the press was first put into operation, plant operators followed the recommendation of a Standard Oil lubrication specialist and used STANOIL Industrial Oil in the hydraulic system. In over four years of continuous hard service, there has been no lost time because of inefficient performance of the hydraulic oil.

Oil capacity of the system is approximately 9 barrels; only 2 barrels make-up per year has been required. The oil in this system has never been changed. It has been centrifuged once to remove moisture which accumulated over three years' operation. Periodic tests of oil samples have shown that STANOIL Industrial Oil has maintained its high lubricating quality. A recent analysis showed no increase in viscosity of the oil, no change in color, and a neutralization number of only 0.13 mg. KOH/gm.

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Or write: Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

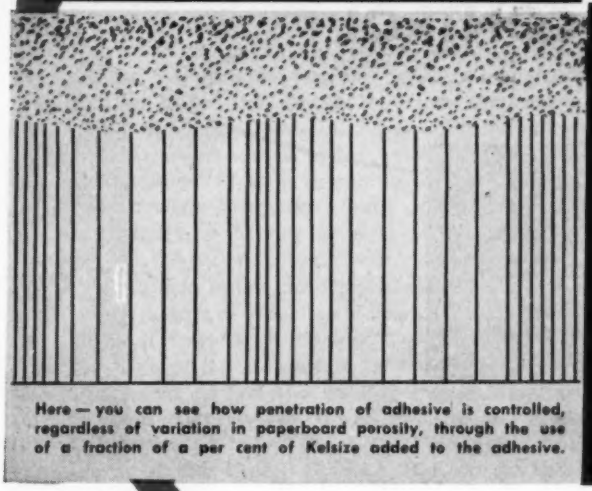
See what Stanoil offers you...

You'll find the means to significant savings in this booklet. It describes the important qualities of STANOIL Industrial Oil and the resultant benefits which have made this multi-purpose oil the choice of midwest manufacturers for a host of important lubricating jobs. Discover how STANOIL will give you superior protection through its unique combination of six outstanding characteristics, including high stability and effective rust prevention. Find how STANOIL can simplify stock, storage, and inventory in your plant by replacing special-purpose oils in hydraulic systems, speed reducers, air compressors, machine tools, electric motors, auxiliary turbines, and a wide variety of circulating, bath, and bearing systems. Ask the Standard Oil lubrication specialist from your nearby Standard Oil office for this booklet, or write: Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago.

STANDARD OIL COMPANY **STANDARD** *(Indiana)*

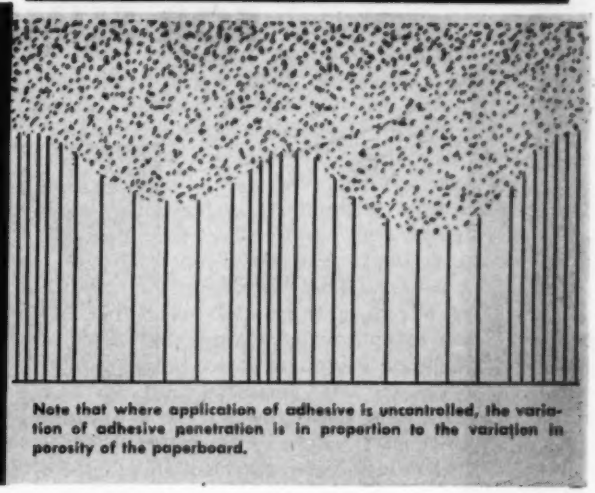
FOR UNIFORM PENETRATION
OF ADHESIVE IN CORRUGATED PAPERBOARD

CONTROLLED PENETRATION WITH KELSIZE



Here — you can see how penetration of adhesive is controlled, regardless of variation in paperboard porosity, through the use of a fraction of a per cent of Kelsize added to the adhesive.

UNCONTROLLED PENETRATION



Note that where application of adhesive is uncontrolled, the variation of adhesive penetration is in proportion to the variation in porosity of the paperboard.

. . . use KELSIZE

KELSIZE . . . gives you these advantages

- Less adhesive used . . . less moisture to remove
- Reduced warping . . . stiffer board
- Higher machine speeds
- Adhesive where you want it . . . where it's needed

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The Paper Industry

March 1952

Progress in cooperation

Trade associations are by no means new. They trace their origin back to the Merchant Guilds of the Middle Ages. Historians have even demonstrated that they existed in crude form during the early Chinese dynasties prior to 1600 B.C.

But only in comparatively recent years have trade associations flowered into well-run organizations working efficiently for the industries which they serve. Many of the larger associations support extensive research programs aimed at furthering the interests and development of their members. Nearly all have highly paid staffs of executives who devote their time and knowledge to benefiting in every way possible the growth of firms and organizations supporting them.

The American Paper and Pulp Association is by no means the largest of these trade groups. Neither is it the oldest. (However, the oldest trade association in the country *did* have a part in its founding. One of APPA's parent groups, the Writing Paper Manufacturers' Association, was organized in 1850 and holds the distinction of being the first trade association established in the United States.) But, on the celebration of its 75th anniversary February 18-22 it showed a development of which its members and the industry as a whole may well be proud. During its annual meeting at the Waldorf-Astoria Hotel in New York, N.Y., the APPA was host to more than 1,500 representatives of paper manufacturers and allied firms from throughout the United States and Canada.

These men didn't attend the convention just to wish the APPA a happy birthday; although the glittering Diamond Jubilee banquet was almost worth the traveling expense. They participated in the program so that they could be better fitted to serve their industry. They attended the more than 100 group, divisional, and committee meetings set up to teach new ways and means of operations: in the mill, in the office, and in the sales organization. And they returned to their firms wiser for their participation.

Perhaps over the next 75 years the APPA will far outshadow its present place in the industry. Next year's meeting will undoubtedly be bigger and better than the 1952 gathering. But the organization can afford to pause now with pride of accomplishment, for in three-quarters of a century it has helped shepherd a fledgling industry to a position of respect and power as the sixth largest in the nation.

Dollars well spent

Great strides have been taken in recent years to combat the problem of stream pollution caused by paper mill waste. Especially has this been true in Wisconsin, where member mills of the Sulphite Manufacturers Research League have banded together for the sole purpose of reducing pollution through the most economical and efficient means possible. Over the years this group has made available millions of dollars to League and independent researchers to further their programs of experimentation.

The problem is by no means solved. But neither have the millions of dollars devoted to its solution been ill-spent. Only recently did the Wisconsin mills reaffirm faith in the ultimate result of the expensive research by voting to the League for 1952 the largest operating budget in its history. Past developments resulting from experimentation have shown beyond doubt that success will eventually reward the effort.

Coupled with the desire to reduce life-killing stream pollution is a sincere effort on the part of paper mills to create, from the now-discarded waste, products that will benefit the public and industry alike. In Wisconsin alone experiments have been made for the utilization of spent sulphite liquor as road binder, fertilizer, as a yeast base for pet foods, vanillin, and as an industrial fuel.

But, regardless of the effort put forth by the paper industry to meet state demands for the reduction of stream pollution, no effective results can be expected as long as materials required for the proper evaporation and burning equipment are on the list of those allocated by the government only to defense needs. Perhaps when priorities are eased, vital stainless steel and other necessary metals will be made available to paper manufacturers so that long-delayed programs aimed at the reduction of stream pollution may be carried out.

Meanwhile, firms such as Northern Paper Mills of Green Bay, Wis., are doing the next best thing. The firm ordered equipment for a proposed evaporation-and-burning plant more than a year ago, immediately after state pollution authorities had approved the engineering plans. However, the government stepped in to delay the project by refusing to allocate the type of stainless steel required for the construction of an evaporator of Swedish Rosenblad design. In the interim Northern is attempting to put its waste to the best possible use by making it available to city and county authorities for use as binder on unpaved streets and roads.

HAS YOUR SAVE-ALL CAPACITY KEPT UP WITH YOUR PAPERMAKING CAPACITY?

The increased volume of stock handled by hard working, fast running paper machines means increased volume of white water.

It doesn't pay to try to handle it on save-all equipment that's not big enough for the job.

Bird Save-Alls of adequate capacity quickly pay for themselves. The dollars worth of stock that can be recovered per day is readily determined.

Better look into it.

BIRD MACHINE COMPANY
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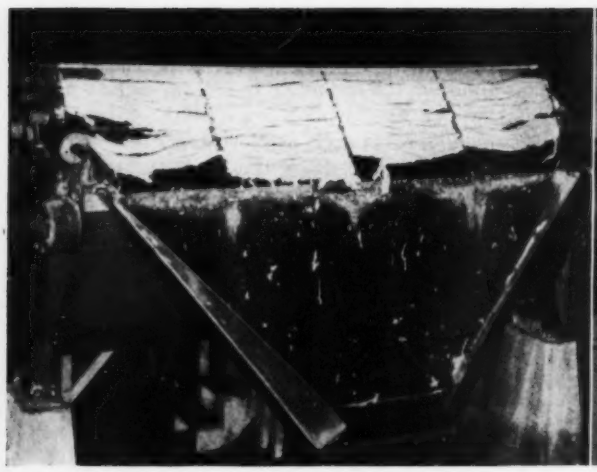
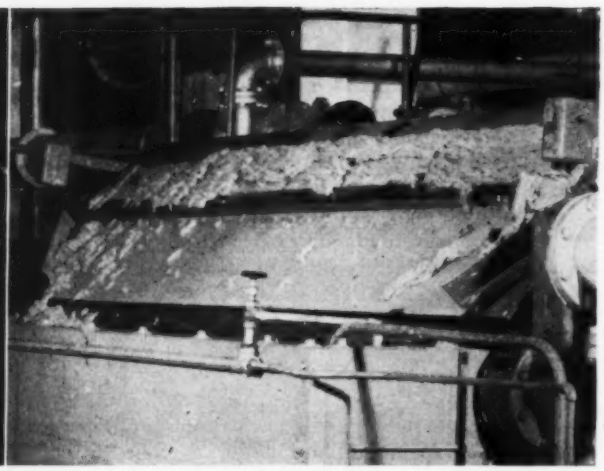
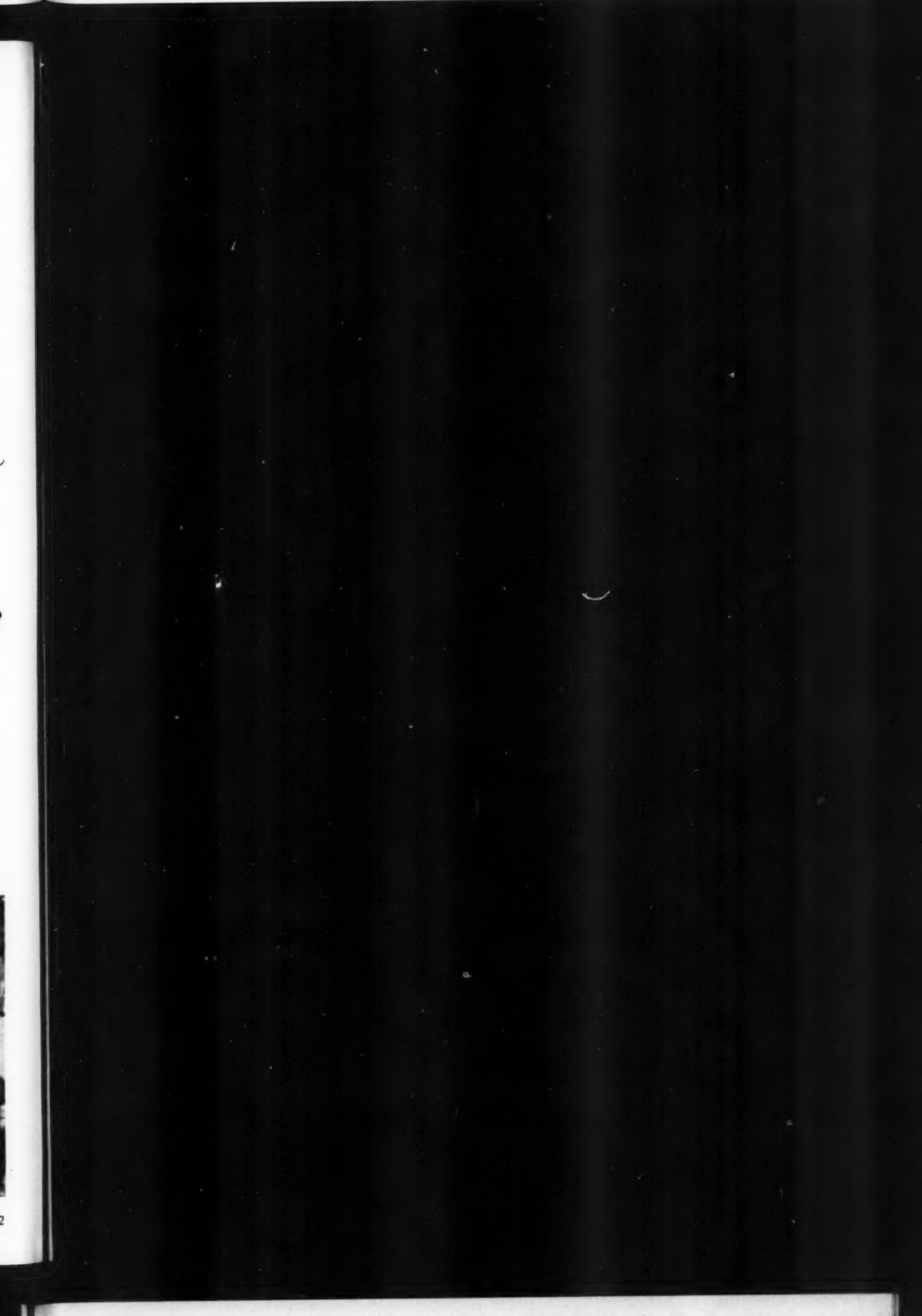
THE BIRD SAVE-ALL







The Paper Industry Current Comment

Serious difficulties overemphasized

The impact of increased taxes is having a definite effect on the paper market, but the recent bearish report in a New York commercial paper that the paper industry is experiencing serious difficulties is entirely unwarranted. It is certain that the pressure of the new and heavier taxes is being felt and might well be a foretaste of worse difficulties if the present suicidal overexpansion of federal government spending is not curtailed.

The present difficulties can well be analyzed as the need for funds to meet the first quarter tax payments. For the time being, merchants and consumers have curtailed buying to conserve funds for tax payments and have delved into rapidly decreasing inventories to supply their needs rather than continue to place orders with the mills. That this is a first quarter problem only, however, is the general belief of the industry, though this temporary slump may readily result in a slight drop in ultimate 1952 production from the record high of 1951. The most pessimistic informed opinion is that 1952 tonnage will not be much below 25,000,000 tons, as against 1951's 26,000,000 output; and many of the more optimistic students of the field believe that 1952 production may pick up after the tax slump, to result in an over-all output of 7 per cent over 1951 paper production. The definite drop in the paperboard field will probably be chiefly responsible for any falling off in the total paper-paperboard output in 1952.

A significant phase of the current situation is the fact that despite the tax slump, prices have not perceptibly dropped.

Production records

Production figures for 1951, now becoming available, indicate some startling increases over any previous output records, despite a 100 per cent increase in imports of foreign papers and paperboards to meet the huge consumer demand.

The situation in newsprint is distinctly easier, and contemplated expansions, both in the United States and Canada, will serve to alleviate the world shortage in this cultural product. The United States Congressional committee assigned to investigate the newsprint situation, under the chairmanship of Congressman Celler, has issued a report on pulp with no conclusions or recommendations, because conditions since the committee finished its hearings in June, 1950 have so radically changed that a re-investigation of the entire problem would be necessary to establish an up-to-date analysis of the picture. Production patterns, pricing levels and sources of market pulp are among the factors which would require a re-examination of the pulp picture as a background to the newsprint situation. In other words, the Celler Committee, after months of hearings, "got nowhere fast."

Paper has been so definitely recognized as an essential industry that it is eighth on the list of those entitled to consideration in the issuance of certificates for rapid amortization, as well as in meeting the nation's military man-power problem.

Financial reports

Except in a few instances, the slump in the stock market in mid-February had little effect on securities in the paper manufacturing field. Market averages dropped to the December lows, but paper mill stock remained relatively strong.

Net incomes

American Writing Paper Co.—Net income for 1951 was $623,982, as compared with $596,746 in 1950.

Brown Co.—Net income for the year ended November 30 was $7,430,040, as compared with $4,021,940 the previous fiscal year.

Champion Paper & Fibre Co.—Net income for nine months ended December 31 was $7,480,286, as compared with $7,645,496 in the comparable period in 1950.

Chesapeake Corp.—Net income for 1951 was $5,000,503, as compared with $2,777,335 in the previous year.

Container Corp.—Net income for 1951 was $12,065,997, as compared with $12,016,626 in 1950.

Continental Can Co.—Net income for 1951 was $15,210,720, as compared with $14,873,172 for 1950.

Eastern Corp.—Net income for 1951 was $1,979,077, as compared with $1,542,841 the previous year.

H. R. MacMillan Export Co. Ltd. (recently amalgamated with Bloedel, Stewart & Welch to form MacMillan & Bloedel Ltd.)—Net income for 1951 was $15,611,138, more than double those of 1950.

Keyes Fibre Co.—Net income for 1951 was $1,065,917, as against $1,361,795 the previous year.

Masonite Corp.—Net income for three months ended November 30 was $926,824, as compared with $1,349,121 for the same period a year ago.

Mead Corp.—Net income for 1951 was $6,109,000, compared to $6,377,397 for the previous year.

New Haven Pulp & Board Co.—Net income for the fiscal year ended September 30 was $896,638, as compared with $308,859 in the previous fiscal year.

Rayonier Inc.—Net income in 1951 was $11,024,300, as compared with $10,803,383 in 1950.

Rhinelander Paper Co.—Net income for the fiscal year ended September 30 was $1,307,126, as compared with $1,484,005 in the previous fiscal year.

Rising Paper Co.—Net income for the fiscal year ended November 4 was $263,694, as compared with $198,801 in the previous fiscal year.

Sutherland Paper Co.—Net income for 1951 was $2,647,530, as compared with $2,784,850 the previous year.

United Board & Carton Corp.—Net income for 24 weeks ended November 10 was $498,080, as compared with $307,405 for the comparable period a year ago.

Dividend declarations

Crystal Tissue Co. has authorized payment of the regular quarterly dividend of 15 cents per share and an extra dividend of 30 cents a share on common stock, both payable December 30 to holders of record December 20.

General Box Co. has declared a regular quarterly dividend of 4 cents a share, an extra 4-cent dividend, and a 5 per cent stock dividend. All are payable December 21 to stockholders of record December 10.

Great Northern Paper Co. has declared an extra of 60 cents and the regu-

lar 60-cent quarterly dividend on common, both payable December 5.

Robert Gair Co. has declared a quarterly dividend of 30 cents per share on the common, payable March 11 to stockholders of record February 20. Also declared were full cumulative dividends for 1952 on preferred stock, $20 par value, payable in quarterly installments of 30 cents, March 11, June 10, September 10 and December 10 to stockholders of record February 20, May 20, August 20 and November 20.

Hinde & Dauch Paper Co. has declared an extra dividend of 30 cents and the regular quarterly dividend of 30 cents, both payable December 22.

International Paper Co. has declared the regular quarterly dividends of $1 per share on the cumulative $4 preferred stock and 75 cents per share on the common stock. Both are payable March 24 to holders of record February 25.

Lily-Tulip Cup Corp. has declared a dividend of 62½ cents per common share to stockholders of record March 3, payable March 17.

Minnesota & Ontario Paper Co. has declared a quarterly dividend of 50 cents a share payable January 25 to holders of record December 28.

National Container Corp. has declared the regular quarterly dividend of 25 cents per share on the common, payable March 10 to stockholders of record February 20. Also declared was the regular quarterly dividend of 31¼ cents per share on the corporation's $1.25 convertible preferred stock, $25 par value, payable March 10 to stockholders of record February 20.

Nekoosa-Edwards Paper Co. has declared a dividend of 40 cents and a special dividend of 25 cents per share payable December 12 to holders of record December 3.

Northern Paper Mills has declared two quarterly dividends, $1 on common and $1.50 on preferred stock, both payable March 10 to stockholders of record February 20.

Rayonier Inc. has declared a 100 per cent common stock dividend.

River Raisin Paper Co. has declared a quarterly dividend of 20 cents per common share payable December 21 to stock of record December 7.

Scott Paper Co. has declared a quarterly dividend of 60 cents per share on the common stock, payable March 12 to shareholders of record February 26; also, the regular quarterly dividends of 85 cents per share on the $3.40 cumulative preferred shares and $1 per share on the $4 cumulative preferred shares, both payable May 1 to shareholders of record April 17.

Sorg Paper Co. has declared a 5 per cent common stock dividend, payable February 15 to stockholders of record January 31.

Union Bag & Paper Corp. has declared a quarterly dividend of 75 cents and an extra of $1 per share on the common, both payable December 15 to holders of record December 10.

Paper mill corporate changes

Keyes Fibre Co. has taken steps to authorize a new mortgage of $2,500,000 to refund the present outstanding mortgage of $1,988,000 and to provide capital for increased capacity.

Oregon Fibre Products, Inc., has applied to the Securities and Exchange Commission for authority to issue $2,500,000 of 5 per cent sinking-fund debentures, due on January 1, 1968. The company also registered applications for the sale of 5,000 shares of 6 per cent cumulative preferred stock of $100 par value and 50,000 shares of common stock of $1 par value.

Owens-Illinois Glass Co. is reported to be negotiating for the sales of its paper container division to Robert Gair Co. in exchange for Gair stock.

Scott Paper Co. has announced that the Crocker First National Bank of San Francisco is acting as the company's transfer and exchange agent for shares of Soundview Pulp in the current exchange of common stock on the basis of 1¼ shares of Scott common for each share of Soundview.

New York Stock Exchange—Stocks
(Closing Prices)

	Feb. 20, 1952	Jan. 21, 1952
A.P.W. Products	6	6⅝
Celotex	17⅝	17⅞
Same Preferred	16¾	* 16½–17⅛
Certain-teed Products	14⅛	14⅝
Champion P. & F. Co.	26⅛	25⅝
Same Preferred	101½	* 98–99½
Chesapeake Corp.	33	33
Continental Diamond	14	14½
Container Corp.	34⅜	35⅛
Same Preferred	* 99–102	* 99–100
Crown Zellerbach	55⅝	55¼
Same Preferred	100⅝	99⅝
Dixie Cup	31¼	* 34½–35½
Eastern Corp.	23	24⅛
Robert Gair	17¼	18⅞
Same Preferred	* 19¼–19½	* 19⅝–19⅞
Gaylord Container	30⅜	27½
International Paper	46⅝	46⅝
Same Preferred	*100⅝–103	*101–103
Kimberly-Clark	44	47
McAndrews & Forbes	42–43	* 42½–44
Marathon	† 25¼	59
Masonite	29	31⅜
Mead Corp.	25	25½
Same Preferred	91¼	* 92½–96
National Container	12¼	12⅝
Rayonier, Inc.	62	67⅝
Same Preferred	36½	35¼
Scott Paper	53	53½
Same $3.40 Preferred	* 90⅝–92	* 90½–91
Same $4.00 Preferred	*103⅜–104	*103–106
St. Regis	21⅜	18⅜
Same Preferred	89	90
Sutherland Paper	24½	23⅝
Same Preferred	104½	*106¼–107½
Union Bag & Paper	46⅛	48⅞
United Board & Carton	16⅝	* 16¼–16⅞
United Wall Paper	3¼	4⅛
Same Preferred	* 25¼–25¾	* 27–27¼
U. S. Gypsum	102	110½
Same Preferred	169½	*170–175
West Va. P. & P. Co.	73	* 78–78½
Same Preferred	107¾	107

New York Stock Exchange—Bonds

Celotex 3½%	.....	99
Champion P. & F. Co. 3⅝	.....	101
Mead Corp. 3%	.....	98

New York Curb Exchange—Stocks

Am. Writing	11⅝	.....
Great Northern	57	56
Hammermill	39½	42

*Closing Bid and Asked Prices.
†New.

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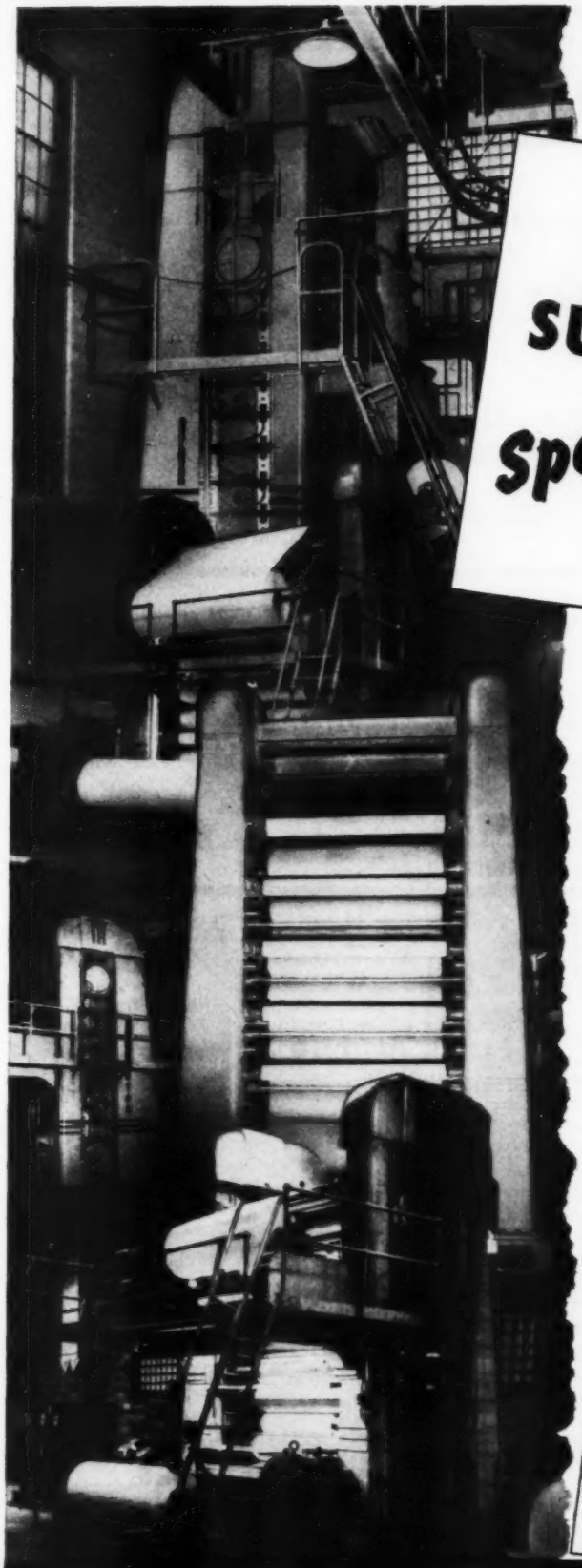

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Sales	Castle and Overton, Inc., New York
Representatives	Pacific Coast Supply Co., San Francisco and Portland

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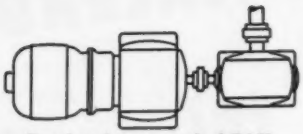
Ask yourself these speed reduction questions . . .

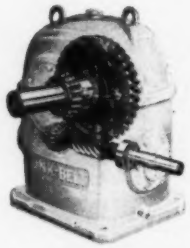
1 Do I want high-ratio reduction with right-angle takeoff?



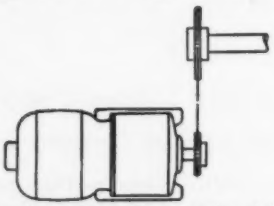
Drawing shows motorized P.I.V. variable speed and worm gear drives direct-coupled.

Then your answer is a LINK-BELT Worm Gear Drive

Reduction ratios: 3.1:1 to 8000:1
Torque: 1,400 to 123,000 in. lbs.
Output shaft rpm: 0.22 to 564



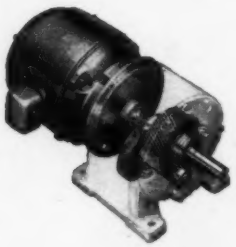
2 Is space at a premium?



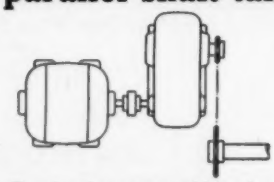
Drawing shows gearmotor with roller chain drive.

Then your answer is a LINK-BELT Gearmotor

Reduction ratios: 6.2:1 to 292:1
Hp range: 1 to 30
Output shaft rpm: 6 to 280



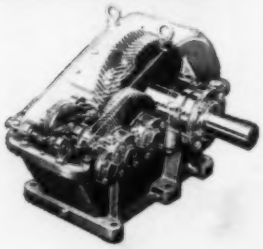
3 Will I need high hp capacity with parallel shaft takeoff?



Drawing shows motor with herringbone gear and roller chain drives

Then your answer is a LINK-BELT Herringbone Gear Drive

Reduction ratios: 2.84:1 to 318:1
Hp range: ½ to 1000
Output shaft rpm: 2 to 600



Yes, LINK-BELT builds all 3

WHATEVER factor governs your speed reducer selection—ratio, space, shaft position, shock loading—you can get the exact answer to your needs from Link-Belt's complete line of enclosed gear drives.

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The Paper Industry News of the Industry

Global Group Allots Newsprint to Six Nations

Six nations otherwise unable to obtain supplies have been provided 6,150 tons of newsprint by the International Materials Conference, meeting in Washington, D. C. The conference stipulated that such emergency allocations would have to be replaced in the near future by "normal commercial transactions."

The six countries receiving the allocations are as follows: Ecuador, 500 tons; Germany, 2,000 tons; Israel, 400 tons; Spain, 750 tons; Turkey, 500 tons, and Yugoslavia, 2,000 tons. These figures bring to 33,650 the number of metric tons shipped from North American sources to 18 nations since last April.

New Program Contemplated

The IMC is considering a broader program for 1952, which would center on encouraging trade in newsprint through normal commercial transactions. The over-all newsprint situation was to be reviewed in February on the basis of new statistics required from all countries of the free world concerning their production and requirements.

According to the IMC, the objectives of the program now contemplated would be to recommend again strictly limited emergency assistance to countries in special need. Under such a program consumer nations would have to show that, before applying for aid, they had exhausted the possibilities of obtaining deliveries through private channels. After that, they must have applied for relief to the government of the producing country. Recourse to the IMC would only be as a last resort.

DPA Approves Newsprint Mill Construction

The Defense Production Administration has given approval to the building of three multi-million dollar paper mills, which will boost this country's output of newsprint by more than 20 per cent.

The agency issued certificates of necessity providing for federal tax benefits to aid the following construction projects: Bowater Southern Paper Corp., Charleston, Tenn., $51,500,000; Southland Paper Mills, Inc., Harty, Texas, $15,040,000, and West Tacoma Newsprint Co., Steilacoom, Wash., $5,000,000.

Despite DPA approval, construction work cannot be undertaken unless the government allots certain scarce materials now under priority. Since newsprint is considered essential, approval is likely.

DPA still has pending applications for tax certificates for a $7,000,000 project of Great Northern Paper Co., Millinocket, Maine; a $1,500,000 project of Michigan Paper Co., Plainwell, Mich., and a $214,000 expansion program of Crown Zellerbach Corp. at West Linn, Ore.

N. American Newsprint Output at January High

Total North American newsprint output for January exceeded that of any January on record, according to figures released by the Newsprint Service Bureau. Production was 567,672 tons, with shipments of 540,258 tons, as compared with continental production of 545,978 tons and shipments of 516,602 tons in January 1951.

Canadian mills produced 17,437 tons more in January 1952 than in January 1951, which was an increase of 3.8 per cent. The output in the United States was 4,257 tons, or 4.6 per cent, greater than that of a year ago, making a total continental increase of 21,694 tons, or 4 per cent.

Actual production in Canada (including Newfoundland) during the month was 470,456 tons, while shipments amounted to 445,212 tons. Output in the U.S. was 97,216 tons, and shipments were 95,046 tons.

Stocks of newsprint paper at the end of January at Canadian mills were 127,154 tons, while those at the U.S. mills were 9,738, making a combined total of 136,892 tons. This compares with the 109,478 tons on hand on December 31, 1951, and the 126,759 tons at the end of January 1951.

Newsprint in Better Supply; But Shortage to Continue

While the critical shortage of newsprint in the United States has eased temporarily, the world demand will exceed the supply for years to come. This was the opinion voiced recently by J. Noel Macy, director of NPA's printing and publishing division, as he appeared before a House Commerce subcommittee in Washington, D. C.

Mr. Macy told the group that this country entered the year with an inventory surplus of 81,792 tons out of the 6,056,657 tons available in 1951.

The witness was questioned closely about rumors of another possible increase in the price of Canadian newsprint. These, it was said, might amount to as much as $4, $5, or even as much as $10 a ton over the present $116 base.

Nearly 1,000,000 More Tons

of newsprint will be available from Canada by 1960 under a program

NEWS HIGHLIGHTS

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planned by producers there. Cranston Williams, general manager of the American Newspaper Publishers Association, says that the program calls for increasing production in the next eight years by 914,000 tons, which could bring total Canadian capacity to 6,161,000 tons.

Newsprint Imports in 1951
were approximately 4,900,000 tons, an increase of 2 per cent over 1950, according to figures released by the Census Bureau. Value of the imports amounted to $513,121,006, compared to $452,990,427 for 1950. Newsprint exports during the year totalled 74,000 tons, of which 71,000 tons were domestic newsprint and 3,500 tons foreign newsprint for re-export.

A Buyers' Market
for newsprint in New York, N. Y., has been reported by the *Wall Street Journal*. An article in the *Journal* dealt with the reactions of consumers to Canadian proposals for an increase in the price of about $20 per ton. The spot market newsprint price in the city was said to be below $180, in sharp contrast to the $300 ruling of last summer. The contract price is $116.

More than 800 Weekly Newspapers,
out of a total of more than 10,000 in the United States, will be able to continue publication this year as the result of newsprint diverted to them by about 15 large daily publishers, NPA announced recently.

57,000,000 Newspapers
were purchased daily by North American readers during a recent six-month period, according to a survey by the National Geographic Society.

Finland Is Increasing Newsprint
production 25 per cent in response to an appeal from the United Nations Educational, Scientific and Cultural Organization for efforts to ease the world shortage.

French Language Newspapers
in Canada were to ask the federal government to prevent any further price increases in newsprint. The papers also have requested that the federal 10 per cent sales tax on newsprint be removed immediately.

Chile's First Newsprint Mill
has been approved by the ministry of economy and commerce. Private U.S. investors will finance construction and operation of the $10,000,000 plant. The mill has been announced as capable of producing 50,000 tons of newsprint annually, while costs are expected to be lower than in the U. S. and Canada.

Latin American Countries
have been offered aid in developing newsprint production by the United Nations Economic and Social Council. The Chilean delegate to the UN reported on a project to set up a newsprint mill at Concepcion and to increase production of an existing mill with loans from the United States.

Newsprint from Cane Waste
is to be produced in a Mexican mill. Aaron Saenz, head of the sugar producers association, has announced that the $4,500,000 plant would have an annual capacity of 30,000 tons. A pilot plant with a yearly capacity of 5,000 tons is already producing pulp for Monterey box factories. The new plant, to be built at El Mante in the sugar region, will use bagasse mixed with a type of reed known as "otate."

Brazilian Newsprint Sources
were explored recently by a U.S. congressional delegation. The country has large stands of timber, but they are distant from adequate transportation.

Stream Pollution Research in Wisconsin Costs Millions

Complete figures have never been assembled on the total efforts of the pulp and paper industry to reduce stream pollution, but the outlays in Wisconsin alone add up to tremendous figures. This was revealed recently when Jesse M. Holderby addressed students enrolled in the Engineering Institute of Industrial Waste Problems at the University of Wisconsin. Mr. Holderby is vice president of Lake States Yeast Corp. and manager of the by-products division of Rhinelander Paper Co.

Speaking of the organization and activities of the Pulp and Paper Industry Advisory Committee on Waste Disposal, Mr. Holderby pointed out that the bulk of public attention has long been focused on the relatively small sulphite pulp section of this industry because of the difficult technical problems presented in the non-pollutional use and disposal of spent sulphite liquor. Meanwhile, the rest of the industry has for all practical purposes solved the other pollution problems of pulp and paper making at a huge cost in effort, equipment, and cash outlay.

"Careful estimates of money expended by the industry to reduce sulphite pollution in Wisconsin exceed $5,000,000," Mr. Holderby declared, "yet all of this expenditure has not yet brought us the final answers. It is a conservative conjecture that the industry's total outlays have been even greater than this to reduce the flow of waste materials, both fibrous and non-fibrous, into streams. At one time it was universally accepted practice to discharge bark, screening and whitewaters to the stream with no attempt to modify their pollutional characteristics. Now, every mill in this state so processes these wastes that they are to all intents and purposes no longer significant in the pollution of our streams.

"Much of the credit for this improved situation properly belongs to the joint efforts of the industry and of the state authorities cooperating in the Pulp and Paper Industry Advisory Committee on Waste Disposal. Speaking for the industry, I can assure you that the pulp and paper manufacturers of Wisconsin will continue to employ their technical and financial resources in this field of research until their contribution to stream pollution has been cut to the absolute practical minimum."

Expansion of Wisconsin Pollution Central Body Suggested at Madison

A recommendation for the expansion of the Wisconsin State Committee on Water Pollution to include civilian, municipal, industrial and conservation or agricultural interests was made January 31 during the Engineering Institute of Industrial Waste Problems at Madison.

The proposal was included in a paper by H. A. Rothchild of Neenah, technical director of Kimberly-Clark Corp. The paper was read in the absence of Mr. Rothchild by J. M. Holderby of Rhinelander Paper Co.

Wisconsin stream pollution control laws are now administered by a five-man committee of state representatives. The recommended change follows the pattern of the Michigan Water Commission, which has seven members, four from the state government and three public representatives. Under this policy, the cities, industries, and agriculture have a direct but not controlling voice.

Mr. Rothchild cited the pollution abatement work of the paper and pulp mills, which finance research and exchange information on the best methods to stop the pollution of river and lakes.

Emphasizing the elimination of suspicion and distrust that marked earlier phases of the state's pollution control efforts, the speaker said that "in recent years contracts between the industry and the state have swung to the attitude reflecting a gratifying degree of confidence and trust. We no longer

theorize on what effects pulp fibers have on clogging the gills of fish or the effect of spent sulphite liquor on water life."

Mr. Holderby said that the yeast process and the burning of evaporated liquor offered the best solution to the disposal of sulphite liquor. The yeast is having a brisk market as a poultry and livestock feed—a waste converted into a marketable product by research.

Actual 1952 Budget Announced

More money than ever is going into cooperative research during 1952 to cut Wisconsin sulphite stream pollution, it was announced recently in the annual financial report of the Sulphite Pulp Manufacturers' Research League. A total of $147,000 has been budgeted for the year by member mills, an increase of $9,500 over 1951.

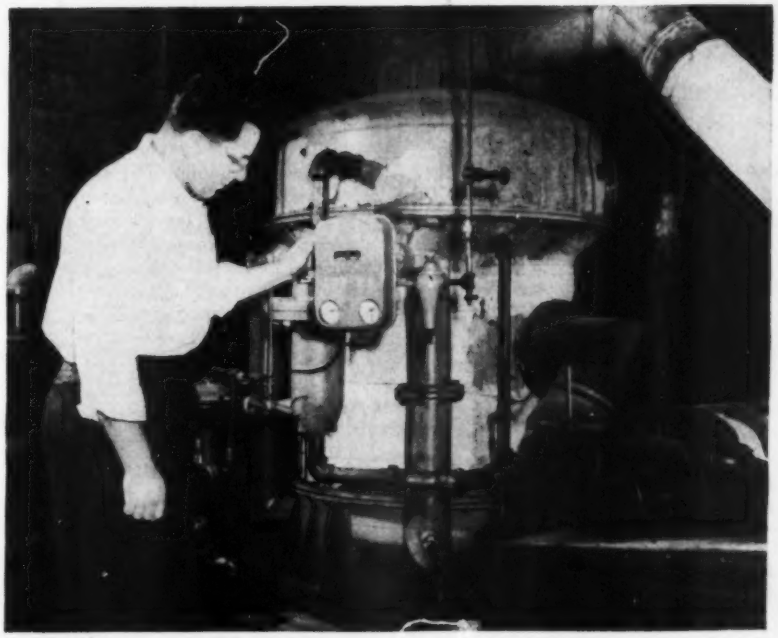
Summarizing the financial affairs of the League during its first 12 years of existence, J. M. Conway, president, has informed member mills how their research money totalling $930,260 in this period has been spread among different projects. (Individual mills over many years have spent an estimated $5,571,000 in Wisconsin on research, experiments, development, construction, and equipment.)

Throughout its 12 years of existence the League has devoted $264,916 to studying the yeast process for treating sulphite liquor, $105,328 to evaporating and burning the liquor, $327,662 to research projects conducted for the League by universities and other institutions covering these and other fields, and $232,354 to other projects. As an instance of "other projects," Mr. Conway cited the trickling filter method of treatment, in which $41,369 had to be invested over a five-year period before pilot-plane results proved it was not practical.

Consolidated Experiments with Navy Equipment

In search of a more practical way to evaporate excess water out of spent sulphite liquor and thus reduce stream pollution, Consolidated Water Power & Paper Co. is testing equipment that was originally designed for making drinking water out of sea water for Navy ships. A pilot plant at Consolidated's mill in Wisconsin Rapids is running spent liquor through a sea water still to provide data from which company engineers can determine whether the process will fit pulp manufacturing operations.

Consolidated's research men are working in cooperation with Cleaver-Brooks Co., Milwaukee manufacturer of sea water stills, to test a vapor compression evaporator. This equipment uses a compressor to reheat the steam from the spent liquor and is theoretically capable of doing the job at a lower cost than evaporation methods that have previously been employed in paper industry experimentation. After several months of testing, the engineers believe they have discovered the type of equipment necessary to produce the desired results.



SEA WATER STILL undergoing experiments at Consolidated for evaporating excess water out of spent sulphite liquor. The Cleaver-Brooks equipment, being tested as a vapor compression evaporator, was originally designed for Navy use in making sea water fit for drinking

Tests thus far have been conducted on spent liquor from a neutral sodium semi-chemical pulping operation at the Wisconsin Rapids mill to develop the engineering data without the damage that might occur to the bronze parts of the equipment if operating on sulphite liquor at the high temperatures involved. The next step is to operate the equipment experimentally on spent sulphite liquor for a period long enough to discover whether any other complications might arise. If everything goes successfully at this stage, the final step is to have equipment made of corrosion-resistant alloys and run a tryout on a full commercial scale.

Improved Processes for Producing Torula Yeast

Process improvements are underway at the Rhinelander plant of Lake States Yeast Corp. to produce torula yeast meeting the highest pharmaceutical standards. At the Lake States plant, which adjoins Rhinelander Paper Co., new equipment and better processing have increassed the nutritional value and flavor of the product. Typical addition is two German-made centrifuges costing more than $10,000 each, which permit refining the yeast to a new high.

The experimental yeast plant was constructed four years ago in efforts to find practical and economical uses for spent sulphite liquor, thus reducing stream pollution. Since that time, it has been proved that the yeast is a wholesome, valuable food, and that it can be produced successfully from the spent liquor. The firm is now trying to broaden the market by creating a yeast of acceptable flavor and high nutritional standards so that it will find wide acceptance as an enrichment for human foods.

Spent Liquor Used for Protecting Icy Roads

In an effort to make sand hold better on icy highways and thus take the worst skids out of winter driving, experimenters in Park Falls, Wis., are using spent sulphite liquor to bind the grit to the slippery road surface. If the tests prove successful under typical Wisconsin conditions, the new method would permit sanding long stretches of icy road that are now left dangerously slippery simply because there is no practical way of providing an abrasive surface.

Road sanding is always expensive. The approved mixture of sand and chemicals costs about $3 per cubic yard, and spreading the material costs about $3 more. When the grit lies loose on the iced road, wheels of passing cars throw much of it to the shoulder, and most of what remains is lost when the snow is plowed.

Trials this winter have been made by wetting glare ice with hot sulphite road binder and following close behind

with an application of sand. The sand freezes to the road surface and thus provides a more lasting grit to prevent skids.

The hot sulphite road binder seems to pit the glare ice surface when it strikes. The secret of successful sanding is to have the sand truck with rotary sand slinger following so closely behind the sprinkler truck that the sand hits before the liquid has had a chance to freeze. Sulphite liquor is being used because it comes hot from the mill at no cost.

The Price County Highway Commission is conducting the tests, using road binder provided by Flambeau Paper Div. of Kansas City Star Co. Engineers of the Sulphite Pulp Manufacturers' Research League have been cooperating with paper mill and road officials because of their interest in reducing the sulphite pollution of streams.

Industry Experiencing "Boom Days" on Pacific Coast

Favored with the largest pulpwood reserves in the nation, the Pacific Northwest and California are experiencing a substantial increase in pulp and paper production, according to a report by the California State Chamber of Commerce.

In the past all pulping operations on the Pacific Coast were confined to the northwest. Only in recent years has California entered into this phase of the industry.

As shown in an industry-wide study of the pulp, paper and board industry on the Pacific Coast, California experienced better than a 50 per cent increase in employment in this field between 1947 and 1951. However, the study points out that western production of most paper products is substantially below consumption demands in the area. Nationally, estimates indicate that by 1955 per capita paper consumption will be an annual 409 pounds per year.

Kraft Manufacturing Breaks all Records

In 1951 the kraft paper manufacturing industry exceeded all of its past production records. The same held true for the paper and paperboard industry as a whole. Annual production of unbleached kraft paper during the year exceeded 2,500,000 tons, approximately 7½ per cent greater than the 1950 production, the previous high record year. This compared with the 7 per cent increase registered by the paper and paperboard industry as a whole.

The industry operated throughout 1951 at about 98 per cent of capacity, a new high annual rate of operations, which when applied to a new high volume of capacity as well, readily accounts for 1951's production achievement. The industry's unfilled orders file today is almost identical to that of the first week of 1951, showing that despite unprecedented production throughout 1951, the industry's demand was also at record levels.

Despite a new high in production, the increase in the manufacture of kraft was not consistently uniform among its several largest grades. As compared with an over-all 7½ per cent increase in production, shipping sack paper production increased by 20 per cent, asphalting paper by more than 25 per cent, gumming paper by 9 per cent, grocers bag paper by 12 per cent, and other bag and sack papers by 16 per cent; whereas wrapping paper declined by 18 per cent and envelope paper by 3 per cent.

The Kraft Paper Association, Inc., reports three major reasons for the increased production: (1) the addition of two new machines in the South and one on the Pacific Coast; (2) an increase in the efficiency of the present paper machines and other supporting mill facilities, and (3) a shift of machines operating on other products toward unbleached kraft paper production, with a consequent reduction in their production of sulphate board or bleached kraft paper.

Mill Expansion Plans . . . . . .

St. Regis Florida Mill Opening Announced

St. Regis Paper Co.'s mutli-million dollar pulp and paper mill on the St. John's River at Eastport, Fla., is slated to begin production by the end of September, according to an announcement by company officials. Construction is progressing on schedule, and some of the machinery and equipment has been delivered.

Meanwhile, another phase of the project, the planting of 1,000,000 slash pine seedlings on a 1,400-acre site, is well underway. Albert Ernest, vice president and forestry expert for the firm, has declared that the planting, starting the first of the year, should be completed in early spring. The planting is being done by machine. The seedling forest is to be used for demonstration to farmers who plan to enter the pulp supply field. In years to come some of the growth will be cut for use in the mill. However, the bulk of the raw material is to come from the firm's 220,000-acre tract in the Sewannee Forest in Georgia.

The St. John's River plant is one of two projects that St. Regis is now building. The other, an addition to the installation at Pensacola, is scheduled to begin production the end of March. Both projects, started in 1951, will entail expenditure of approximately $40,000,000.

Scott-Soundview Announce Everett, Wash., Mill

Scott Paper Co.'s Soundview Pulp Div. has announced plans for the construction of a paper mill at Everett, Wash. The mill is to be built next to Soundview's pulp plant. Scott has applied for a certificate of necessity and hopes to start construction by fall.

According to G. W. Pepper, Scott vice president, it is expected that eventually the Everett mill will be larger than the main Scott plant at Chester, Pa. No cost for the project has been announced as yet. The plant is to serve both the West Coast and the Asian market. The new mill will use pulp in slush form piped from the adjoining Soundview plant.

NPA Extends Certificate of Colorado Firm

The certificate of necessity granted Columbine Development Co. has been extended to March 22 by the National Production Authority. Columbine is seeking to develop a $23,000,000 pulp mill near Newcastle, Colo.

Columbine's request for a $15,000,000 RFC loan was denied some time ago. However, the belief is that prior to the NPA deadline private capital will be raised to finance the project. The firm's contract with the Forest Service for several million feet of beetle-killed timber in the White River National Forest was extended last June.

Racquette River Paper Plans Gift Paper Production

An industry new to northern New York State was to be put into operation about March 1. Racquette River Paper Co. was reported planning the production of gift wrapping paper at a plant in Potsdam.

The firm has leased the former Socony Vacuum storehouse and will market about 100 different designs. Work is underway to install equipment for automatic winding, as well as facilities for marketing and shipping. As many as 400 rolls will be turned out daily.

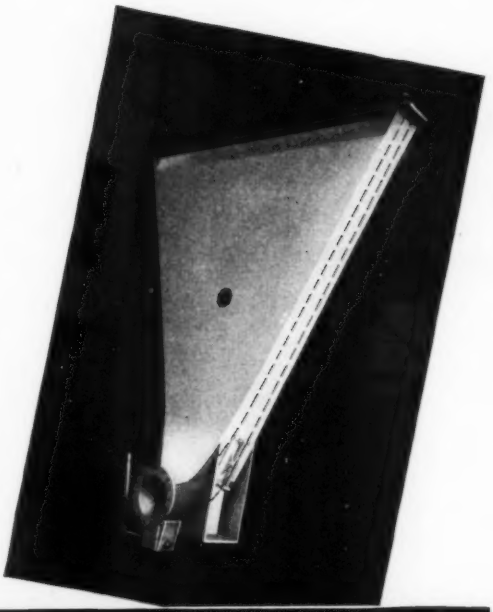
A. B. Clark of Potsdam, formerly associated with the firm, will be superintendent of the plant.

National Gypsum Completes Oklahoma Paper Mill

Full operation of the Pryor, Okla. mill of National Gypsum Co. has been announced by the firm's president, Lewis R. Sanderson. Designed and constructed in 10 months, the new plant makes National Gypsum entirely self-sufficient in its paper needs. The mill will supply up to 150 tons of paper liner per day to

A Flow Spreader

for every Condition



There is a patented Goldsmith-type Flow Spreader manufactured by Puseyjones for the most diverse paper machine conditions.

Flow Spreaders are in successful operation on Fourdrinier and on Cylinder machines ranging in width from 49" to 234" with flow quantities as widely different as 500 g.p.m. and 35,000 g.p.m. They are designed to permit ideal formation of paper and board of widely different sheet weights and over a wide range of machine speeds.

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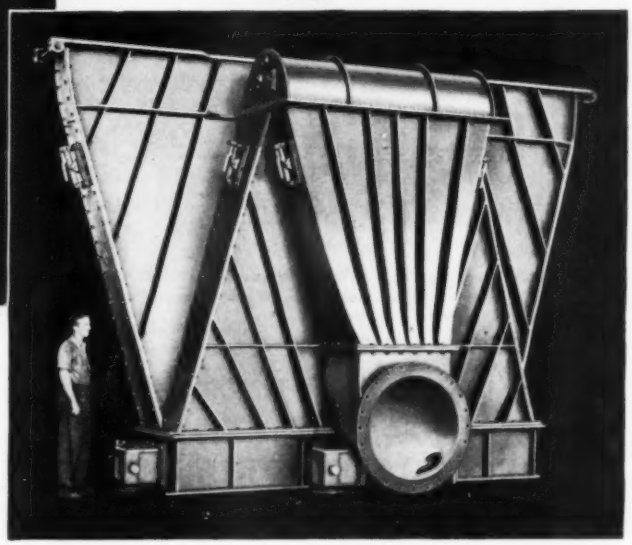
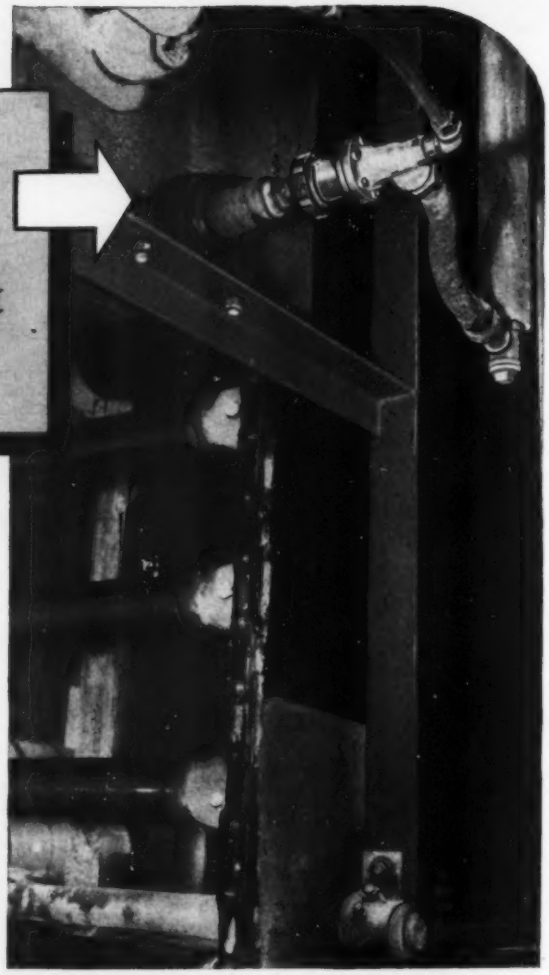


Top, a single-pass Puseyjones Flow Spreader for narrow and medium width machines.
Center, a three-pass Puseyjones Flow Spreader for medium width machines.
Right, a three-pass Puseyjones Flow Spreader for wide machines.

"Barco Revolving Joints give us the PERFORMANCE we want on paper coating rolls!"

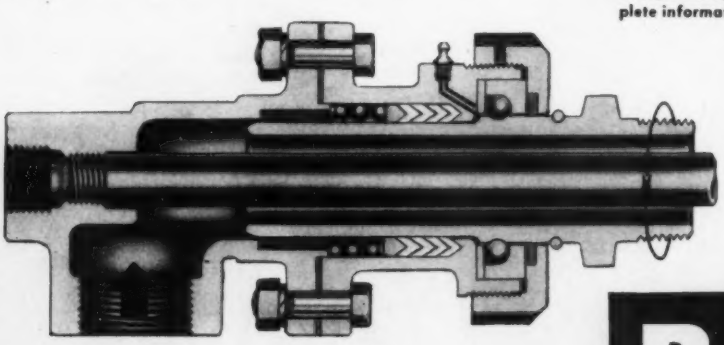


The above picture shows one of the Barco joints used by the Lloyd A. Fry Roofing Co., Summit, Ill., on a paper coating roll. For complete information on Barco Revolving Joints, send for Bulletin 300.

Says CHIEF ENGINEER
Francis Nelson of
Lloyd A. Fry Roofing Co.,
Summit, Illinois

■ Operating engineers throughout the country are reporting the benefits they receive from Barco's new *improved* Type IBR Revolving Joints. These are benefits that come from the *correctness* of Barco's design. There is minimum increase in torque (friction) under increased steam pressure—thanks to Barco's exclusive "CTR" V-type seal rings and ball bearings. Also note the wide spacing between bearings which holds bearing loads and wear to a minimum.

Barco builds a complete line of standard revolving joints in sizes ranging from ½" to 2" and special in sizes to 5". Pressures to 250 psi, steam, or 1000 psi, hydraulic. Speeds to 2500 rpm. *Barco Engineers are at your service; ask for recommendations.*



- **Better Temperature Control where steam is used for heating rolls, due to better circulation.**
- **Free-Floating, Low Torque Installations.**
- **Up to 50% Power Savings.**
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JOINTS
For Paper Machine Dryers, Calenders, Paper Converting Equipment

ENLARGED CORRUGATED BOX PLANT recently opened by National Container Corp. at Chicago; the floor space has been doubled to 135,000 square feet, while truck shipping facilities have been trebled and railroad trackage expanded

the company's board plants at Rotan, Texas; Fort Dodge, Iowa, and Medicine Hat, Kans.

The 125,000-square foot plant uses as raw material groundwood, sulphite, and several grades of waste papers that are converted to the finished product by a 450-foot Black-Clawson paper machine. Paper produced at the mill is used in the manufacture of fireproof gypsum board products, including gypsum lath, wallboard, and exterior sheathing.

In order to control stream pollution, a saveall unit was installed to clean waste water. Paper fiber thus recovered is pumped back into the processing operation.

Gardner Organizes New Research Department

Organization of a new department of carton research has been announced by Gardner Board & Carton Co., Middletown, Ohio. The department has been planned so that it can concentrate on finding new markets and customers, to help develop new products, and to coordinate these efforts with sales promotion advertising. John F. Hagar, associated with Gardner since 1950 as a member of the sales management staff, has been named director; Roland W. Richardson is to be supervisor.

Gardner has spent more than $8,000,000 since 1946 to increase production. Biggest steps in the program included the construction of a retail box plant and the purchase of two rotogravure presses for the firm's Lockland operations.

Expansion Notes

Weyerhaeuser Timber Co.
has announced that the addition to its sulphate pulp plant at Longview, Wash., will be in full production by May 15. Daily capacity is to be between 200 and 250 tons. Installation of the paperboard machine was started in late January.

Nekoosa-Edwards Paper Co.,
Port Edwards, Wis., has completely modernized its causticizing department with the installation of a continuous Dorr system. Capacity has been increased to 200 tons per day, as compared to the original 120 tons. One result of the improved system is better chemical recovery and reduced loss of sodium compounds in the discharged sludge.

Union Bag & Paper Corp.
is reported to have purchased 664 acres of timberland in Clinch County, Ga., from Woodrow Lee. The price is said to have been $23,285.85.

A New Source of Supply
for Weyerhaeuser Timber Co.'s Springfield, Ore., pulp plant has been realized with the completion of the firm's sawmill in North Bend. Chips from sawmill waste are now transported by rail to the Springfield plant for kraft pulp manufacture. A hydraulic sawlog barker has been installed in the sawmill to provide for bark-free edgings, trim ends, and slabs.

Saginaw Envelope Co.,
a division of American Paper Box Co., started operations recently at Saginaw, Mich. Mrs. J. H. Stark is president of the firm; James E. Stark is production manager, and Robert S. Stark is sales manager.

The New Zealand Government
has accepted a proposal by a part-American combine to establish a 30,000,000-Australian pound newsprint mill in that country. The combine consists of Merritt, Chapman & Scott Corp. and Raymond Concrete Pile Co., both of the United States, and the New Zealand firm of Fletcher Construction Co. The entire management and financial control will be within the dominion. The newsprint will be used to meet local requirements, while large exports will also go to Australia.

Safe-way Packaging Co.,
Toledo, Ohio, has leased a two-story building with 10,000 square feet of floor space for the expansion of operations.

Stone Container Corp.
has completed in Chicago a fully equipped photographic library, which will be used in developing new techniques for printing advertising on corrugated boxes.

Wastepaper Consumption Up, But Dealers Still Burning

Wastepaper consumers and dealers have disagreed for the second time in three months over current market conditions. While consumers have released figures showing that mill usage had risen in the period from January 7 to February 2, wastepaper dealers continue to term the market absolutely "dead."

Mill consumption for the period, according to the Eastern Conservation Committee of Wastepaper Consuming Industries, was 21 per cent higher than the weekly average for December and 13 per cent over the November figure. Mill receipts were placed 14 per cent higher than December and 12 per cent above November averages.

However, wastepaper dealers have reported that the tempo of burning wastepaper rather than selling at the current low market prices is being stepped up. They asserted that most mills were shut down for a week during the Christmas holidays and for a half-week at Thanksgiving, thus lowering weekly average consumption figures considerably for November and December.

Record Receipts and Consumption

Meanwhile, final figures for 1951 showed wastepaper mill receipts and consumption both topped the 9,000,000-ton figure for the first time. December receipts of 547,593 tons swelled the year's total to 9,246,718, while consumption in the same month of 544,970 tons boosted the 12-month figure to 9,072,348.

Predicting the market for 1952, dealers and packers have estimated that consuming mills will call for only half as much of the secondary material this year as they used during 1951. With most paperboard and tissue paper mills overstocked, dealers have about given up hope of a pick-up in business during the first quarter.

Consumers Optimistic

On the other hand, a committee of wastepaper consumers has told an NPA divisional meeting that the industry's business outlook for 1952 is a reasonably "optimistic" one. According to the committee, all grades are in fair-to-good supply.

In recommending that NPA modify Order M-72, the committee urged that no limitation be imposed at this time on the use of high-grade waste. NPA said restrictions would be retarded on the use of white pulps.

The committee reported no difficulty in obtaining baling materials such as bale ties and roll bands. However, it de-

clared balers are hard to get. NPA declared it would give priority assistance for such equipment wherever possible and whenever the situation warranted such aid.

Hope for Price Recovery
in the scrap paper market has been expressed by dealers in the St. Joseph, Mo., area. A step up in defense production, creating a new demand among paper box manufacturers, is expected to cause a price boost of from 20 to 25 cents a hundred.

Customs Court Cases

Knockdown boxes imported from Japan at San Francisco and from Canada at Detroit are under study by Customs officials, according to Warren B. Bullock, manager of the Import Committee of the American Paper Industry. The issue is as to whether they are dutiable as manufactures of paper or at a higher rate for boxes of coated paper. The boxes are of vat-lined paperboard.

The January docket of the United States Customs Court at New York, N. Y., included one protest by an importer of candy wrappers held for duty as articles of waxed paper, one of filter claimed to be dutiable at the lower rate for paper cut into shapes, three of napkins claimed to be dutiable as paper cut into shapes instead of at the higher rate for manufactures of paper, and one of drawing paper held dutiable at the higher rate for handmade paper.

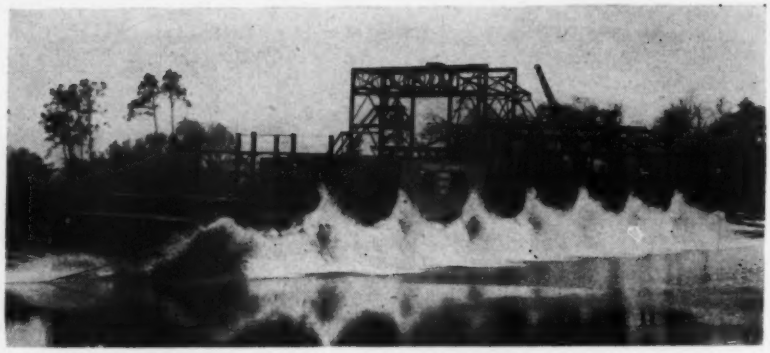
Five shipments of Finnish kraft wrapping paper are before the U. S. court in protest against a Customs finding that the paper was undervalued, and 28 similar protests on such paper are before the court in Philadelphia.

Wellington Fund Increases Paper Industry Investment

The $194,000,000 Wellington Fund, Philadelphia, one of the largest mutual investment companies in the country, substantially increased its investment in the paper industry during the last half of 1951.

The organization purchased 2,100 shares of Crown Zellerbach Corp.; 1,500 shares of International Paper Co.; 1,000 shares of Kimberly-Clark Corp., and 10,000 shares of Marathon Corp. Wellington's total common stock holdings in the paper industry group at the end of the year was as follows: Crown Zellerbach, 12,000 shares; International, 5,000 shares; Kimberly-Clark, 14,000; Marathon, 10,000; Union Bag & Paper Corp., 14,000, and Weyerhaeuser Timber Co., 9,000.

A recent Wellington report to stockholders pointed out that increases were made in the holdings of paper stocks because of their good long-term prospects.



FIRST MARINE PROJECT in the sulphur industry's history hits the waves near New Orleans. From this 200-foot steel barge Freeport Sulphur Co. will mine sulphur in the Louisiana marshlands at Bay Ste. Elaine. The portable plant will supply nearly 2,000,000 gallons of superheated water per day to melt sulphur deep underground. Next summer, it will be towed the 65 miles from Grande Ecaille, where mining equipment is now being installed, to Bay Ste. Elaine and partly submerged in a prepared slip

Sulphur Awards Allot United States 77%

Seventy-seven per cent of the crude sulphur the free world expects to have available during the first six months of this year has been allotted to the United States. The award was announced by the International Raw Materials Conference meeting in Washington, D.C. Canada is to share in the U.S. allocation, but no specific breakdown was given.

Other allocations included: Great Britain, 194,900 tons; Italy, 88,000 tons; France, 64,500 tons; Australia, 58,200 tons, and western Germany, 38,500 tons. The allotments were the first made by the Conference on a six-month basis, previous allocations being for three months only.

The Conference also forecast a continuing shortage of all kinds of sulphur during 1952. Production for the year was estimated at 5,825,200 tons—more than 1,500,000 tons short of demand.

Domestic Sulphur Production Tops All Past Marks

Production of domestic sulphur during 1951 established an all-time record for the industry, according to reports from producers. Output totaled 5,278,249 long tons, 2 per cent more than in 1950.

Production exceeded 400,000 tons in every month, reaching the highest levels during the third quarter, when the monthly average was 456,523 tons. In the fourth quarter it declined to an average of 438,096 tons.

Over a period of years prior to 1951, producers' stocks of sulphur declined continuously as sales exceeded production. By 1951 stocks were so low that this practice could no longer be continued, and consequently less sulphur was shipped from the mines than in 1950. Similarly, apparent sales in 1951 of 5,095,347 tons were 10 per cent below 1950. At the end of 1951, producers' stocks stood at 2,837,432 tons.

Forestry Report

Timber Resources Review Launched by U.S.F.S.

Up-to-date information on the timber resources of the United States will result from a review being launched by the Forest Service. The study, which will take at least two years to complete, is designed to re-analyze prospective requirements, supplies, and growth of timber, appraise today's timber conservation programs, and chart a course for American forestry.

According to Lyle F. Watts, chief of the Forest Service, advice in planning the project and help in determining the facts of the forest situation will be sought from state and private forestry organizations, the wood industry, and conservation agencies.

A number of strong forces that have worked both for and against a well balanced timber economy in this country since World War II were cited by Mr. Watts.

On the positive side, industrial and other private timber owners, who hold the bulk of U. S. forest lands, have taken a heightened interest in timber growing. Progress has been made in the Tree Farm Program and other programs sponsored by industry, in state-federal programs of fire control and of technical forestry assistance to landowners, and in more intensive management of public forests. Progress has also been made toward the fuller utilization of the timber harvested.

On the negative side, according to Mr. Watts, efforts to manage, protect,

.....KRAFT.....MARKET.....STRONG

- The demand for high strength kraft papers is strong and appears likely to stay that way. Both civilian and military economies are demanding more kraft.
- For trouble-free production of kraft you can't beat Rice Barton papermaking machines.

RICE BARTON

RB 3-52

Announcing

The New Downingtown Masson-Scott Super Cutter and Layboy

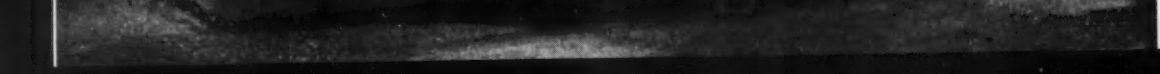
Now introduced for the American Paper Industry

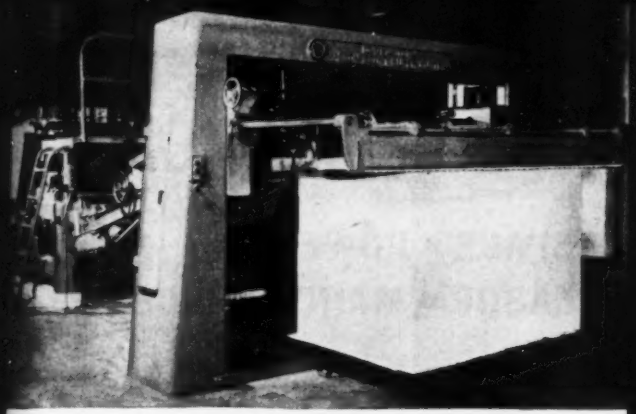
View of the Super Cutter delivery end showing lay at the starting position.

NEW ACCURACY
NEW SIMPLICITY
NEW VERSATILITY
NEW ACCESSIBILITY

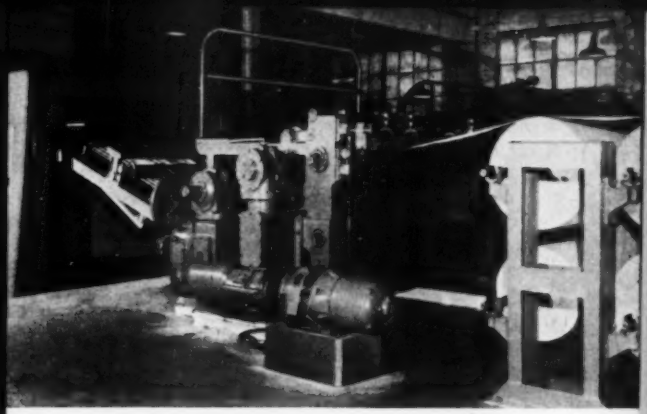
at high production speeds—low maintenance cost

For the first time the famous Masson-Scott Super Cutter and Layboy—developed in Great Britain—is now manufactured in America.

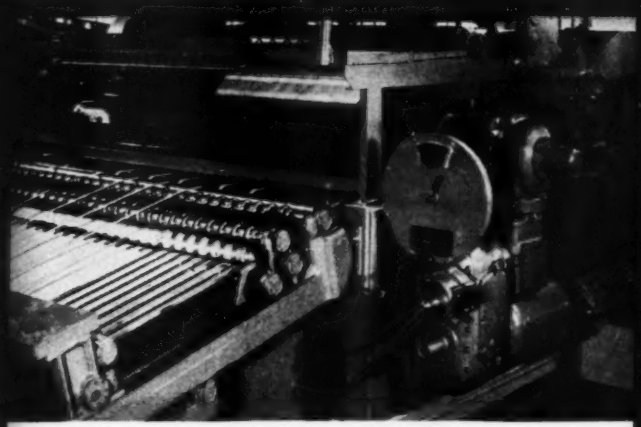




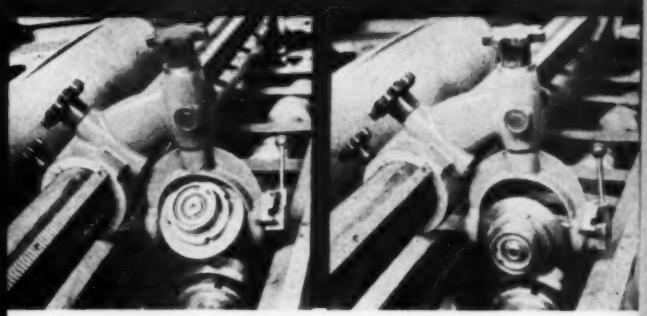
The overlapping layboy piles the sheets from the floor level upwards permitting high stacks with the cutter itself located close to the floor.



The drive, in totally enclosed oil lubricated units, is fastened directly to the cutter frame and is easily accessible.



Another view of the drive side showing adjusting mechanism.



The rack and pinion movement of the top slitter units and the hand-wheels for the depth and angle of engagement can be seen in the photographs above. (Right: engaged. Left: disengaged.)

The Downingtown Masson-Scott Super Cutter and Layboy is a high speed, precision sheet cutting machine developed by Masson-Scott in England over a period of years. It is now manufactured exclusively in this country by Downingtown. The Super Cutter and Layboy is capable of a high rate of production, yet maintains a degree of accuracy not previously associated with rotary sheeting equipment. The machine is precision engineered for sustained high operating speeds. The specially designed cross cutting knives permit an exceptionally clean cut through heavy combined substances. Write for Bulletin No. 252 which describes the Downingtown Masson-Scott Super Cutter in considerable detail.

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Pacific Coast Representative: John V. Roslund, Pacific Building, Portland 4, Oregon
Downingtown Fibrepulper Manufactured in Canada by Waterous, Ltd., Brantford, Ontario

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DOWNINGTOWN

MASSON-SCOTT SUPER CUTTER AND LAYBOY

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SLUSH-MAKER
STOCK-MAKER

Simplicity keynotes the Morden systems of stock preparation. Experience shows that these systems give outstanding results in terms of efficiency and economy for quality control. A simple basic system is shown in the flow diagram, using...

MORDEN "SLUSH-MAKERS" for completely pulping, deflaking, mixing and pretreating the furnish.

MORDEN "STOCK-MAKERS" for continuously beating and refining the stock ahead of the paper machine.

Many adaptations and elaborations of this system are used to suit various mill requirements. May we help you simplify and improve your preparation system with Mordens? Let us know your requirements.

SLUSH-MAKER
MORDEN
Machines Company
STOCK-MAKER

CORBETT BUILDING
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and build up the nation's depleted timberlands are still inadequate, despite recent progress. At the same time, prospective requirements for wood are high. The growth of population has been rapid, with a corresponding rise of wood-using industries, especially the pulp and paper industry in the South. In addition, new inroads have been made by forest insects and disease. These developments, Mr. Watts continued, have put an added drain on forest resources. Though the growth of timber has been increasing, its quality has become poorer.

The present timber resources review will be made under the general direction of Edward C. Crafts, assistant chief of the service in charge of program planning, and William A. Duerr, assistant chief of the Division of Forest Economies.

1951 Forest Service Receipts Distributed

Forty states, Puerto Rico, and Alaska will share $13,974,027, representing 25 per cent of Forest Service receipts from the sale of timber, grazing fees, and special land leases during fiscal 1951, according to a recent announcement from the Department of Agriculture. This is the greatest return ever made to the states from national forests, exceeding 1950's record $8,343,010 by more than 60 per cent.

National forest receipts during the year that ended June 30, 1951, totalled $56,147,341, of which $51,098,565 was from the sale of timber and forest products; $4,165,341 from grazing fees, and $883,203 from special fees from mineral leases, resorts, summer homes, and water power.

The checks to the individual states run as high as $4,292,056 (Oregon) and as low as $39.67 (North Dakota). Each state, with few exceptions, receives 25 per cent of the receipts from national forests within its boundaries. By law, the money is earmarked for public roads and public schools in counties containing national forest land.

In addition to the amounts paid the states, 10 per cent of national forest earnings is set aside for use by the Forest Service in building and maintaining forest roads and trails within states containing national forests.

1951 Tree Planting Below 1950 Record

According to U. S. Forest Service figures, a total of 456,370 acres were reforested throughout the nation in 1951. This brings the total acreage of reforested land to close to 7,700,000, including planting by the Forest Service, Soil Conservation Service, Tennessee Valley Authority, and the Department of Interior, as well as states and private landowners.

Although 1951 tree planting showed a drop of 41,000 acres from the 1950 record, it surpassed the highest five-year average of 453,400 acres, established between 1937 and 1941. The discontinuance of large-scale federal planting and the diminished growing of nursery stock during the war years cut tree planting almost in half between 1945 and 1949. Federal planting and nursery production are not yet up to pre-war levels.

Lyle F. Watts, chief of the Forest Service, believes the slight decrease in 1951 planting was caused by a shortage of planting stock and does not reflect a waning public interest. State nurseries in 20 states reported that demand exceeded supply by a total of 60,000,000 trees.

Efforts are being made to increase state nursery production. Seven states are constructing new nurseries, and 12 are expanding existing units.

During 1951 approximately 46,000 acres of national forest land were planted. At this rate it would take about 100 years to reforest the existing backlog of 4,000,000 acres of denuded national forest land, which includes much remote land at the sources of many of the country's important rivers.

Tree planting on private land has increased tremendously during the past 12 years, almost offsetting the decrease in planting by public agencies. About 49 per cent of the tree planting in 1940 was on private land, as compared to 79 per cent on private land during 1951.

The greatest tree planting activities in 1951 were centered in the South. Leading in reforestation work was Louisiana, with 53,081 acres. Georgia was second with 40,213 acres. In the North, New York was high with 35,033 acres planted. Michigan, which leads in total reforestation over the years, was second with 33,097 acres.

Vast Federal Forestry Program Proposed

The 51st annual meeting of the Society of American Foresters has been told by Leland Olds that conservation is too large a job to be handled under present programs, which depend to a great extent on enlightened ownership. Mr. Olds, former federal power commissioner and now Interior Department's representative on the New England-New York Interagency Committee, proposed a federal program of resource development of $100 billion to be spent over a 30-year period.

In contrast to Mr. Olds' remarks, Clyde S. Martin of Weyerhaeuser Timber Co. recently told members of the American Bankers Association that "the forest products industries have done and are doing a remarkably good job, and private forest landowners are making a very substantial contribution toward forest perpetuation. . . . American business can and will solve its own problems if left free to do so. We need less, not more, controls as applied by our cumbersome and unwieldy federal bureaus.

K-C to Study Forest Insects and Diseases

Practical application of forest pathology and entomology has been announced by Kimberly-Clark Corp., Neenah, Wis. The firm has recently added a forest pathologist and forest entomologist to the staff of its woodlands department. The opening of the new field is thought to be a "first" in the pulp and paper industry.

Generally, the study of forest diseases and insects is a field for government specialists, but Kimberly-Clark, with the recent staff additions, is going one step further. It is pointing toward practical application of pathology and entomology to protect its forest operation from nature. Woodlands staff men explain that managed forests must be protected from diseases and insects as well as fire. The organization plans to find out all it can about such scourges of the forests and then apply methods of control.

Appointed forest entomologist was Paul Flink, a recent graduate of Syracuse University and the University of Michigan. Donald Prielipp of Wausau, a University of Minnesota graduate, is the pathologist. They will work as contact men with governmental agencies.

Wisconsin Plants One Billion Trees in 25 Years

It was recently estimated by an official of the state forestry commission that Wisconsin has probably planted one billion trees in 25 years. Cooperating in the reforestation venture have been federal, state, civic, and private interests.

Even now the tempo is being stepped up. Nurseries are planning increased yields. In 1951 Wisconsin planted 22,000,000 state-produced trees. This year 25,000,000 are to be available. It is predicted that even this amount will not satisfy the need.

Oil Derricks "Drilled" in New Operation

Solution to the current problem of obtaining materials for the construction of vital forest fire lookout towers has been found by the Georgia Forestry Commission. The Commission recently purchased 35 oil derricks from oil centers in Texas.

Guyton DeLoach, state forestry commission director, began his search for towers after the NPA had informed him it could promise no allocation of steel before March at the very earliest, and probably not then. The Commission

decided it would be dangerous to delay the construction of the needed towers, since Southern forests require special protection in the winter and spring months.

In addition to the oil derricks, which are being set in concrete foundations, the Commission has succeeded in purchasing 20 towers from Aerometer Co., Chicago.

Reforestation Gains Impetus in Michigan

Private and state reforestation projects in Michigan received more than 6,892,000 young trees last fall, according to a report from the state conservation department. The figure represents about 500,000 more trees than were provided by department nurseries in the like period of planting in 1950.

Approximately 3,295,000 red, white and jack pine seedlings and transplants were shipped to farmers, industries, schools and communities. Nearly 3,688,000 trees were planted in 11 state forests.

Prisoners' Work Saves Timber

The work of 18 trusty convicts in 1951 helped save $2,561,625 worth of Michigan white pine from disease, according to an announcement by the state corrections commissioner.

The trusties, working out of prison camps at Marquette, Tahquamenon State Park, Wilderness State Park, and the Lehman camp near Grayling, saved more than 14,000 white pines from disease attacks. The crews examined 8,141 trees and cut away diseased parts of 1,369. They also removed currant and gooseberry bushes from around 6,831 pines.

Forestry Notes

More Effective Operation
of Georgia's 105 county forestry units through the establishment of an area forester system was announced recently by Guyton DeLoach, director of the state forestry commission. Sixteen experienced technical foresters will each serve a specific area. They will also serve as assistant district foresters in charge of fire control in the counties they supervise.

11,584 Acres
of pine seedlings were planted on state and private lands in Arkansas in 1951. The total acreage represents a new high in the state reforestation program. Private landowners set out 11,472 acres.

10,000 Seedlings
given free of charge by International Paper Co. were recently distributed to members of the Future Farmers of America in the Mount Vernon-Ailey, Ga., area. Supervising distribution was Carl Adams, Montgomery County forest ranger.

55,300 Pine Tree Seedlings
were planted in the Jacksonville, Fla., area by agricultural students during the Christmas holidays. The trees were donated by the local Junior Chamber of Commerce. Vocational agriculture students at Baldwin received 22,500 seedlings; those at Crescent City 15,800; those at Callahan 12,000, and those at Branford 5,000. The students planted the seedlings on property that they or their parents own so that the trees may be cared for. Florida Forestry Nursery at Lake City provided the seedlings.

Modern Fire Fighting Equipment
has recently been acquired by the Wikles County (Ga.) forestry unit. The unit now has at its disposal a one-quarter ton Jeep equipped with a fire lane plow, a two-way radio, and hand tools. Prior to this all wood fires were suppressed almost entirely by hand tools. The group also announced plans for the construction of a third lookout tower, to be located near Metasville. Necessary materials and the cost of erection are to be donated by Georgia Forestry Commission.

25,000,000 Pine Seedlings
were to be planted before March 1 by Arkansas forest owners as part of the biggest artificial reforestation program in the state's history. To supply the ever increasing demand for more seedlings, the state forestry nursery at Bluff City has been expanded from 62 to 162 acres.

Southern Lumber Co.,
Warren, Ark., has announced that 2,000,000 pine seedlings have been brought into the area for planting. International Paper Co. matches the money spent by individuals in the purchase of the seedlings.

85,000 Pine Seedlings
are being planted in Ashley County, Ark., by Crossett Companies for 4-H Clubs and the Community Farmers of America. Each year Crossett gives away a large number of seedlings to assure a future crop of pulpwood and sawlogs and at the same time instill conservation practices in the youth of the county.

Illustrated Books on Forestry,
prepared and distributed by International Paper Co., are being used by teachers in the sixth, seventh, and eighth grades in Georgia schools. The books demonstrate the advantages and values to be gained from scientific and up-to-date tree farming.

Denver Regional Headquarters
of the U. S. Forest Service's Rocky Mountain Division was to be moved in February from the postoffice building to the Federal Center. About 100 officials and workers are affected by the change.

Three New Forestry Movies
are available for public showings: "In Partnership with Nature," by International Paper Co., New York, N.Y.; "Tree to Trade," by Long-Bell Lumber Co., Longview, Wash., and "From Trees to Paper," by American Forest Products Industries, Inc., Washington, D.C.

Hoberg Analyzes Smoke Abatement Program

Solutions to two important industrial problems have been found by Hoberg Paper Mills, Green Bay, Wis. The firm recently announced favorable results in its installation of smoke abatement control units at two power plants.

First, dense industrial smoke from the company stacks was kept at a minimum, meeting the approval of Anthony Sidlow, Green Bay smoke control engineer. A second and perhaps more important fact was the decrease in fuel costs that resulted after the control equipment was put into operation.

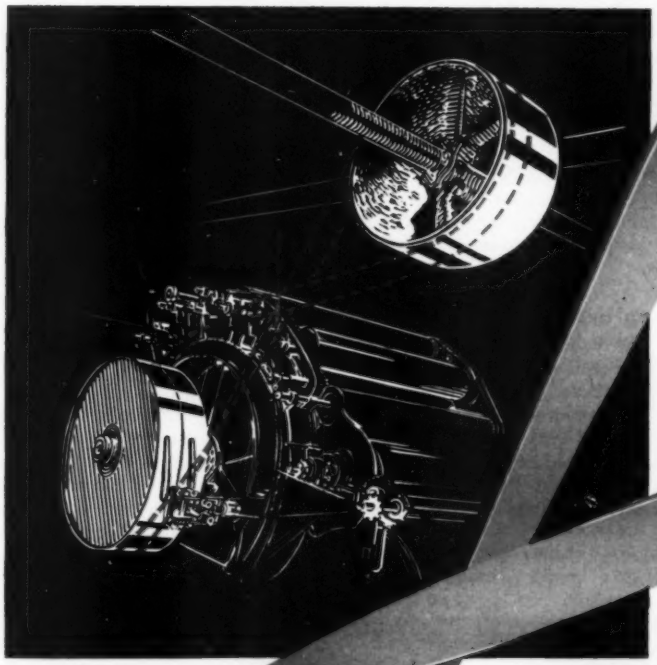
In 1948, when the firm constructed a power plant to serve Division A, electrical and mechanical smoke control units were included in the plans. The plant is equipped with spreader type stokers, and some of the coal is burned in suspension. Fly ash is collected in special equipment, eliminating the air pollution nuisance.

Six months ago a Bailey pneumatic smoke control unit was installed at Hoberg's Division B power plant. The $20,000 project was completed by the company's power and engineering departments under the supervision of Fred Haselow, power superintendent.

In operation, both the pneumatic and electrical units govern stoker operation and are essentially the same. Master control panels contain the brains of the mechanism. Firemen are kept informed of combustion efficiency by a battery of recorders, gauges and dials. Dampers, water levels, and the amount of fuel flowing into the stokers are all automatically regulated. A warning horn is sounded when smoke density in the stacks rises above the density limited by city ordinance; correcting adjustments are made by firemen, and complete combustion is again resumed. Division B boilers are fed from below, and overfire fans create turbulence as an extra aid in mixing unburned combustibles.

Proper amounts of fuel and air are combined automatically, assuring the

your pulleys will drive your machines only as well as your belts drive your pulleys



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greatest degree of combustion per pound of coal. Before the system was installed, a maximum average of 18,740 pounds of steam could be produced from one ton of coal in a given six-month period. One ton of coal is now producing 20,013 pounds of steam for the same period. Fuel savings for the same period amounted to 925 tons, or approximately $10,000.

Paper Thermometers Developed by Army

Thermal indicators made of paper and capable of instantly determining temperatures of from 115F to 500F have been developed by the Army Quartermaster Corps. The new series of paper thermometers was initially designed to ascertain the thermal radiation of atomic blast, but it is expected that they will also be used for other purposes such as testing the performance of gasoline engines, motors, heaters, etc.

Developed by the research and development laboratories at the Army's Philadelphia Quartermaster Depot, the new thermometers are inexpensive and readily disposable. When commercially produced, the cost of each instrument is not expected to exceed a few cents. They consist of white pigment coatings on black paper, each coating designed to melt at a definite temperature.

When one of these thermometers is heated to its designated temperature, the white coating melts and disappears into the black porous paper, revealing the black background. The change from white to black is not reversible and therefore constitutes a permanent record of the indicated temperature.

St. Regis Denies Shutdown Plans

St. Regis Paper Co. has announced that it has no plans to shut down any of its paper mills in northern New York, contrary to published reports. W. R. Adams, vice president, issued the following statement in connection with the rumor: "The St. Regis paper mill in Watertown will not be sold until a responsible buyer is found to take over its operations. The mill is now running full time."

Mr. Adams continued by noting that the sale of the firm's mill at Oswego will furnish the pattern for any change contemplated at Watertown. "It will be remembered," he said, "that there was no shutdown when the Oswego property was transferred to Marathon Corp." Mr. Adams declared that the firm's mills in Carthage, Herrings, and Harrisville are presently running full-time. No negotiations are in progress or in prospect for the sale of any of these mills.

Representatives of the Watertown Chamber of Commerce had earlier quoted Mr. Adams as saying St. Regis planned to close several properties because its operations had expanded to a point where small mills no longer fitted the firm's industrial pattern.

Fire-Idled Employees
of Pacific Paperboard Co., Longview, Wash., are to receive a retroactive increase in the pay they are no longer receiving. Company officials said the workers will get the increases from last June 1 to January 11 as the result of a WSB ruling. January 11 was the day that fire swept through the main part of the plant.

WSB Approves Wage Boosts

The Wage Stabilization Board has approved pay boosts in contracts covering 17,500 West Coast paper workers and 11,000 employees in southern mills. An increase of 12½ cents an hour was approved as negotiated between the Pacific Coast Association of Pulp and Paper Manufacturers and the AFL workers union.

The southern agreement provided an increase of 8 cents an hour for 10 mills, including the Camden, Ark., mill of International Paper Co. The agreement was negotiated by the AFL paper workers and AFL electrical workers unions. The board varied from its standard formula in sanctioning the increase by considering July 1, 1950, as the base rate for computing the permissible increases. January 1, 1950, is the usual base date. All adjustments were approved retroactively to June 1, 1951, the date on which the contracts were signed.

Minnesota & Ontario Paper Co.,
International Falls, Minn., has announced cost-of-living wage increases of 3 to 5 cents an hour for members of nine paper mill unions. The boost is to be retroactive to December 15.

A One-Day Walkout
was ended recently at the Camden, Ark., plant of International Paper Co. when workers voted at a mass meeting to return to their jobs. Company officials denied a report that the work stoppage was in protest of the dismissal of an International employee and also in protest to a drive for speeding production.

MEASURING LAST YEAR'S GROWTH of spruce on a MANDO reforestation project planted in 1947 are (L to R) Henry Rutledge, president of the Minneapolis Chamber of Commerce; Edward P. Chapman, chairman of the chamber's natural resources committee; Clarence Prout, director of the Minnesota Division of Forestry; George Amidon, MANDO forest management director; Chester Wilson of the Minnesota Conservation Commission, and Dr. Frank Kaufert, director of the University of Minnesota Div. of Forestry

Businessmen Tour MANDO Woods Operations

Forest management and conservation practices were demonstrated to a group of Minneapolis businessmen when they toured Minnesota & Ontario Paper Co.'s woods operations recently. The group, members of the Minneapolis Chamber of Commerce's natural resources committee, plus senior chamber officials and professional conservationists, were given a three-day trip into the woods of northern Minnesota. MANDO's forest management director, George Amidon, conducted the tour of inspection that covered more than 250 miles.

The 37-man party toured the timberlands in Koochoching County by chartered bus. They inspected pine plantations and logging camps, observed pulpwood harvesting, and on return to International Falls were conducted through the firm's pulp, paper, and insulation board mills there.

Values of forest management were explained, as were the methods applied to the harvesting and utilization of trees on a sustained yield basis. Company officials pointed out the progress made in recent years in the management of five large forest management districts in which timber is inventoried and the practice of cutting mature and overmature trees carried on.

The group was told of the high degree of cooperation between MANDO and the government. The firm harvests timber from five management districts totaling 2,460,000 acres, about 73 per cent of which is owned by federal, state, and county governments.

Two Wisconsin Mill Execs. Predict Good Year Ahead

Forecasting favorable conditions in the paper industry, presidents of two Wisconsin producers recently looked ahead to happy times.

D. C. Everest, president of Marathon Corp., declared, "Regardless of the many factors affecting general business, the consumption of paper and paperboard and the products made therefrom will in 1952 exceed any previous year in the history of the United States . . . Since 1945, consumption of paper and paperboard has increased over 50 per cent and now exceeds 400 pounds per capita per annum, despite the great growth in population during that period of time . . . Government expenditures will have a great effect on paper and paperboard consumption and may interfere with the mills being able to meet civilian demand. No one ever heard of any major government agency returning any appreciable amount of its appropriations to the federal treasury."

J. M. Conway, president of Hoberg Paper Mills, Inc., declared, "A paradox may be drawn on the outlook for business in 1952. Settlement of the Korean situation on the basis of a clear-cut victory for the United Nations is mandatory if we are to prevent further dissipation of our nation's resources and the waste of human lives . . . Still, the Korean War and the preparedness program involving billions of dollars will underwrite in a large measure a high level of production and employment . . . Increased productivity and employment in 1952 points to a high national income, in spite of high taxes."

Canadian Developments . . .

Hecate Development Ltd. Applies for License

Hecate Development Ltd., jointly owned by Powell River Co. Ltd. and Aluminum Co. of Canada Ltd., has applied to the British Columbia government for a forest management license in the Kitimat area. It is reported that the license involves about 350,000 acres of productive forest land, which would be expected to yield an annual cut of more than 80,000,000 board feet.

Some months ago it was reported that the two parent companies had formed Hecate to survey the forest resources of the region. Alcan is currently developing a vast area in the interior and coastal regions of British Columbia to provide power for its huge aluminum project.

A spokesman for Powell River has declared that obtaining a forest management license would be the first step toward developing a large newsprint plant. The location is well suited to a mill installation, since the Alcan project will have a great power excess. Also, Powell River has large stands of timber in the Kitimat Valley and on the Queen Charlotte Islands, where there is no power potential to induce the building of a mill.

Part of the raw materials supply for the proposed mill, should the plans materialize, would come from the area to be flooded by Alcan's power development. Canadian foresters have specified that the government should see that such timber is fully salvaged.

Columbia Cellulose Uses Alberta Coal

Soft coal is being transported from the interior regions of Alberta to generate steam at the Prince Rupert, B. C., plant of Columbia Cellulose. For some time British Columbia coal has been used at the Prince Rupert operation, and demand is growing as firms in the area are settling into their development programs.

According to an industry spokesman, the new move will not only stimulate demand for Alberta coal, which has been slipping in recent years, but is expected to aid financially the Canadian National Railway, reported to be losing revenue on the run. Almost 100 cars are being loaded daily at the Alberta coal fields.

$35 Million Project Planned for Central British Columbia

It has been announced that a $35,000,000 project is being planned for the Quensel area in British Columbia. Included are a new pulp mill and a major hydro-electric plant.

Construction of the pulp mill will be by Western Plywood Co., Ltd., builder of the $1,500,000 plywood plant near Quensel in 1945. Within the next four or five years this firm anticipates a total investment in permanent industry in the area amounting to $20,000,000. The new pulp mill will cost approximately $19,000,000 and will produce a daily 200 tons of bleached sulphite. This will put Western Plywood on a fully integrated basis, as waste wood from the plywood industry and salvageable timber from the forest management license area will be utilized.

The B. C. Power Commission will carry out plans for a power plant on the north fork of the Quensel River in order to supply the power that will be required by the pulp mill. The power project is to be built in two stages, the first costing about $10,000,000. Final installations will develop about 150,000 horsepower.

Canadian Groundwood Pulp Production at Record High

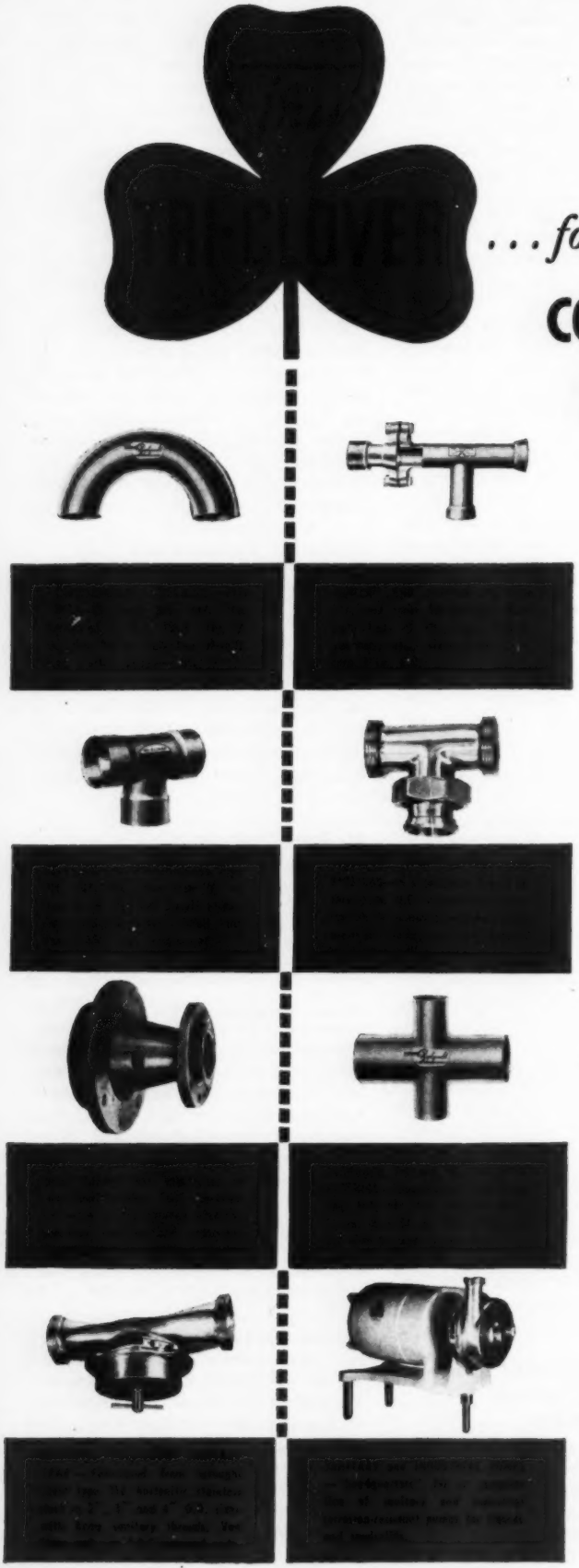
During 1951 production of Canadian groundwood pulp hit an all-time high for the fifth straight year, a Canadian industrialist has reported.

E. J. Thom, chairman of the mechanical pulp section of the Canadian Pulp and Paper Association, told the Association's annual meeting at Montreal that last year's output hit an all-time peak of 1,350,000 tons.

St. Regis Paper Co. (Canada Ltd.) has announced that its new $500,000 plant at Dryden, Ont., is nearing completion. The plant is 510 by 155 feet and covers an area of 75,000 square feet. The new building is to have facilities for four freight cars inside.

Celgar Development Co. Ltd., a division of Celanese Corp. of America, will ask the Canadian government for a 3,000,000-acre forest management license on the Columbia River watershed. About 2,000,000 acres are said to be nonproductive rock and glacial land. If the license is granted, Celgar will go ahead with plans to construct a $65,000,000 pulp and newsprint mill at Castlegar. The area applied for includes a narrow strip on both sides of the Arrow Lakes and the Columbia River, extending nearly 200 miles north from Castlegar.

The Quebec Government, by order-in-council, has authorized the Lands and Forests Department to sell the property known as Chicoutimi mills to Saguenay Pulp & Paper Corp. The mills have been idle for many years and were taken over by the government in 1949 for $1,500,000 from the now bankrupt Quebec Pulp & Paper Corp. The new company will pay $1,200,000 for 1,400 square miles of forestry conces-



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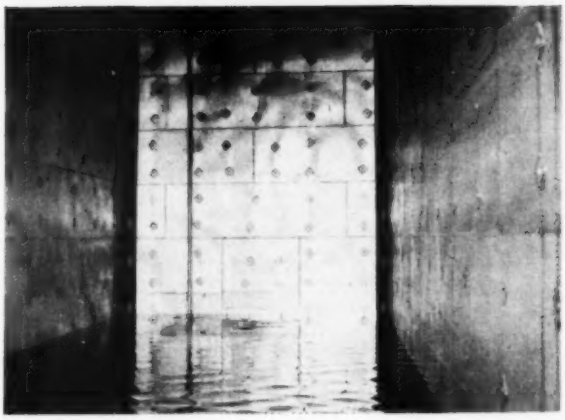
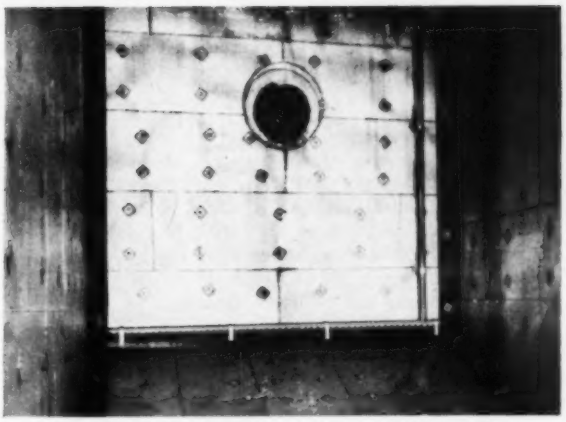


BLOWPIT INTERIOR shows the use of stainless steel at Anglo-Canadian's newsprint mill



INTAKE END of same tank. Note small diameter welded tube at right

Stainless Steel Used to Cut Anglo-Canadian Blowpit Leaks

Engineers at Anglo-Canadian Pulp & Paper Co., Quebec City, Que., have announced the use of stainless steel to prevent leakage and failure in blowpits. Shut-downs of the older wooden units had been proving so costly that company officials approved the innovation.

Stainless steel tanks were installed to handle the pulp as it blows from the digesters. A perforated grating or strainer was built into the bottom of the tank to permit the drainage of liquor. Stainless steel valves and pipes under the tank are closed off, and fresh water fed into the unit through high-pressure nozzles. All remaining sulphurous acid and waste liquor is gradually drained off in this manner, and the remaining stock is left in fairly clean condition, having the characteristic fibrous appearance of sulphite stock. An adjoining equalizing tank is used to receive the washed stock before it goes to the primary screens of the paper machines.

DETAILED VIEW of the 4 by 4-inch plate washers that were used to reinforce the #12 gauge sheet at the point where the 5/8-inch anchor bolt projects through it; such construction enables the unit to withstand acid, heat, and pressure

The metal employed was type 316 stainless steel, supplied by Atlas Stainless Steels. This metal is capable of standing up to the acid, even if it is fairly concentrated, hot and under intermittent pressure. It is felt that the steel walls should last indefinitely.

Some fear existed as to whether the acid might get in behind the stainless steel, thus attacking the concrete. Here it might oxidize into sulphuric acid and attack the stainless steel bolts, sheet lining, and draining equipment. However, this hazard does not exist, and the equipment now operates to produce enough pulp to keep up with a production of a daily 1,000 tons.

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sions in the Saguenay area and $340,000 for the plant and machinery. Some $50,000 per year will be paid for electrical development at the Pont Arnault plant on the Chicoutimi River. Water power development rights on the river at Chute Blanchette will also be rented.

Deerfield Glassine Co., Inc.,
Monroe Bridge, Mass., is constructing a $1,000,000 paper mill in Quebec City, Que. The new plant is to be known as Canadian Glassine Co. Production is expected to begin in June, with products to be designated for the Canadian market only. Wood pulp in slush form is to be obtained from Anglo-Canadian Pulp & Paper Mills Ltd., which is adjacent to the new mill.

Bowater's Newfoundland
Pulp & Paper Mills Ltd., Corner Brook, Nfd., has awarded contracts for a $4,000,000 construction and mill improvement project to two firms, according to G. H. Carson, operations director.

86 Employees
of New Brunswick International Paper Co.'s Dalhousie mill and woods division were honored recently with the presentation of 25-year service awards at a banquet sponsored by the firm. L. S. Henry, mill manager, and F. J. Farrell, manager of the woodlands division, made the presentations. The group included 65 mill division employees and 21 members of the woodlands staff.

Possible Expansion
of the MacMillan & Bloedel sulphate pulp mill at Port Alberni, B. C., has been reported by industry observers in the area. No definite announcement has been made by the firm, but the annual financial report indicates that a great part of the company's profit is to be used for expansion.

All Lumber and Timbers
necessary for the construction of bridges on the road being built between Gibsons Landing and the Howe Sound Pulp Co. mill at Port Mellon, B. C., are being donated by the firm. The seven-mile road is to link the mill to a road that will eventually reach Powell River, and also to a car ferry connecting Gibsons Landing and the mainland.

Kootenay Forest Products, Ltd.,
a newly formed concern, is reported to be considering the construction of a $20,000,000 pulp mill at Nelson, B. C. Kootenay, connected with the operations of Glacier Lumber Co., Nelson, is headed by Walter M. Leutold. Plans call for a mill capacity of 200 tons daily and the purchase of a forest tract of 400,000 acres.

Beverly Pulp & Paper Mills Ltd.
has announced that agreement has been reached with the Alberta government for the construction of a pulp and paper mill on the outskirts of Edmonton. Under the agreement, the firm will begin construction on or before January

1, 1953. The agreement also provides that cutting rights on 2,000 square miles of timberlands will be reserved for the firm for a 21-year period beginning January 1, 1952.

A 40,000-ton Increase
in newsprint production in 1952 at Powell River Co. in British Columbia has been announced by M. J. Foley, executive vice president of the firm. He said that the company had caught up on log inventories and had recovered from the production loss during severe summer weather last year.

Pacific Mills Ltd.
is building a seven-story annex to the Martin Inn at Ocean Falls, B. C. The addition will have a capacity for 450 single employees.

Bathurst Power & Paper Co.
has honored 88 employees with the presentation of silver pins for 15 years' service with the firm. Presiding at the program was J. G. Chalmers, administrative vice president.

Peron Blasts American "Paper Dictatorship"

Following closely on his government's 50 per cent cutback on newsprint allocations to Argentine publications, Dictator Peron recently blamed the situation on the "paper dictatorship" of America and the "newsprint imperialism" of the American free press.

At the same time, *Democracia,* recognized government mouthpiece in the South American country, reacted to the newsprint cutback by picturing on its front page a recent 252-page edition of the Sunday *New York Times* on a weighing scale.

The government-controlled paper blasted "the egotism and sordidness of Yankee imperialism, where a country with only 5 per cent of the world population takes 75 per cent of the world newsprint production."

However, according to observers now in Argentina, the real cause of that country's newsprint shortage may lie closer to home. They note that over the past five years a foreign exchange shortage—and not U. S. policies—has caused Argentine newspapers to cut down in stages to eight pages, or 40 per cent of what is considered normal, even before the latest reduction.

Two Everett, Wash., Firms Ask More Water

Soundview Div. of Scott Paper Co. and Weyerhaeuser Timber Co.'s pulp division, both of Everett, Wash., have entered into negotiations with the city for additional water supply. The pulp mills have offered to up payments from $6 per million gallons to $7.50, providing the Everett water department undertakes three water supply projects that will cost an estimated $1,115,000.

At present, Weyerhaeuser has a contract to use 22,000,000 gallons per day, which they want to increase to 31,000,000. Soundview wants to increase its 48,000,000-gallon daily maximum to 65,000,000.

Wyoming Pulpwood Meeting

Midwest pulpwood plant officials and top U.S.F.S. men were to meet at Cheyenne February 14 in a move to develop a pulpwood industry in the state. The gathering was called by Gov. Frank A. Barrett and J. Edward Smith, chairman of the Greater Wyoming Committee.

The session was planned in an attempt to eliminate several long standing bottlenecks that have handicapped the proposed pulpwood program. Reportedly, pulpwood officials want to determine the type of equipment that will be allowed by the U.S.F.S. for cutting; the various places where timber can be taken; the allowable cut of timber in the various locations, and the length of contract the forest service will allow the pulpwood manufacturers.

Industry Notes

Pulpwood Producing Capacity
in the South by 1953 may have increased by as much as 73 per cent over 1949, according to Frank A. Albert, USFS regional forester. He addressed the convention of the Southern Pulpwood Conservation Association January 16 at Atlanta. Mr. Albert called for an accelerated forestry program to keep natural forest resources adequate to meet expanded industrial demands.

Rhinelander Paper Co.,
Rhinelander, Wis., has announced that the most valuable shipment in the firm's history has recently been completed. The shipment weighed 50,671 pounds and was valued at $33,442, or about 66 cents per pound. The consignment went to Sawyers, Inc., Portland, Ore., which will use the paper in the manufacture of discs for holding stereo transparencies in Viewmaster equipment.

Manistique Pulp & Paper Co.
is again the name of the Manistique paper mill recently sold by Mead Corp. to Trenton Times Corp. The announcement was made by R. G. Hentschell, plant manager, following a conference with the new owners.

25,000 Tons of Unbleached
sulphate wood pulp has been set as the supplementary export quota for the first quarter of 1952 by the Department of Commerce. A previous 25,000 tons had already been made available for the quarter. According to the Department, the increase was made possible because of a temporary easing in the domestic demand. The quota for the fourth quarter of 1951 was 30,000 tons.

Six Tons of Paper
were used by the American Hotel Association last year to supply its members with 244 pages of government laws and rulings on legal and tax matters and wage stabilization. There were in the aggregate 1,500,000 of single-spaced mimeograph paper for the 6,000 members.

Appropriation of $970,000
for a smoke jumper center (a forest service center used by parachuting fire fighters) at Missoula, Mont., has been urged by Rep. Mansfield (D., Mont.). Congress authorized the center last year.

United Wallpaper Inc.,
York, Pa., will discontinue its 20-year manufacturing arrangement with the Atlas mill of Kimberly-Clark Corp. on October 15. The Pennsylvania firm will make all its paper at its work factory. K-C told several hundred employees at the Atlas plant in Appleton, Wis., that it expects to maintain employment for all personnel through expanded output of specialty products.

$600,000,000
is the value which has been placed on Georgia's wood products output during 1951. However, according to Dr. Reavis C. Sproull, technical director of the Herty Foundation Laboratory in Savannah, the production was counterbalanced by an estimated wood waste of an equal amount. He reported that intensive studies are being made at the Foundation concerning wood waste utilization, high pulp and paper yields, the chemistry of lignin, bark utilization, and the utilization of agricultural residue.

E. I. duPont de Nemours & Co.
Wilmington, Del., has discontinued allocations of cellophane and has announced that it is now in position to accept additional orders for the packaging film. Steps taken by the firm in reducing the sulphur consumption in cellophane have made possible the dropping of voluntary rationing.

Damage Estimated at $150,000
resulted from a fire that swept a warehouse owned by Hampton Roads Paper Co., Norfolk, Va., January 29.

Fire Spread Through
a five-story warehouse in Cincinnati January 28. The first, third, and fourth floors of the gutted building were oc-

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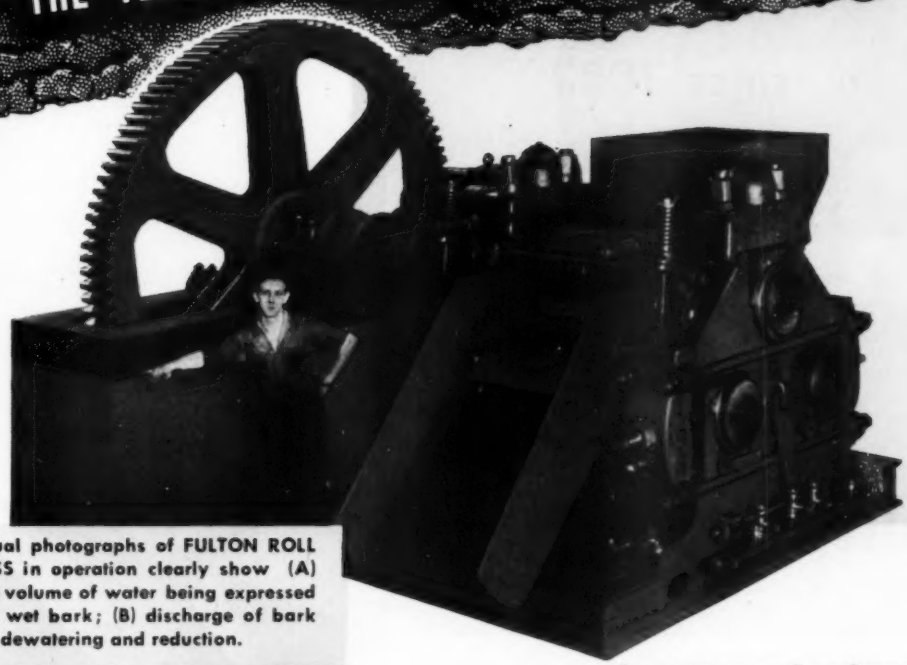
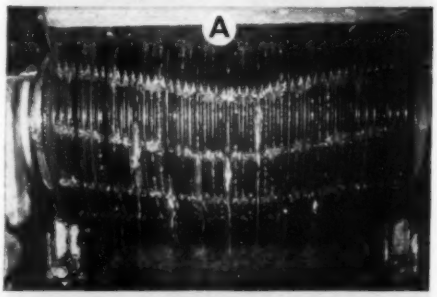


Actual photographs of FULTON ROLL PRESS in operation clearly show (A) large volume of water being expressed from wet bark; (B) discharge of bark after dewatering and reduction.



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$1,800 Damage

was caused February 8 at Holzman & Sons, Milwaukee waste paper firm. Firemen reported that the blaze was apparently caused by spontaneous combustion in waste materials.

Layoffs of Workers

at pulpwood plants in Michigan's Upper Peninsula have been averted by assurances of the Association of American Railroads. Additional gondolas have been assigned from two railroads to ease the jam of logs at shipping docks.

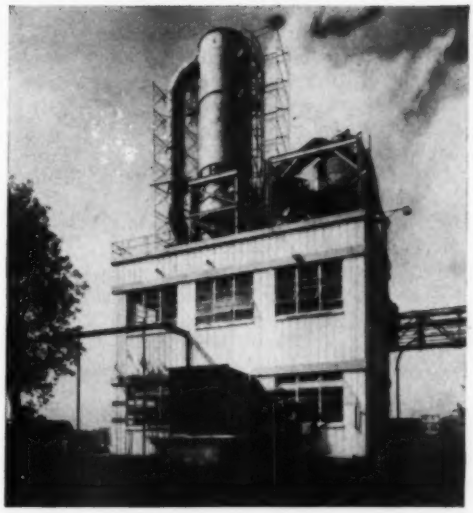
Lunkenheimer Observes 90th Anniversary

Lunkenheimer Co., pioneer valve manufacturer, celebrated its 90th anniversary in Cincinnati January 14-18. A special program keynoted the firm's annual sales conference. Paul M. Arnall, president and general manager, made the anniversary address at a meeting of sales personnel from throughout the United States and many foreign countries.

Mr. Arnall termed 1951 "Lunkenheimer's biggest year from the standpoint of volume and total production." He paid special tribute to 15 of the firm's oldest employees, each of whom have been with the company for at least half its history.

Recognition was also given 82-year-old George Angert, a Cincinnatian who was associated with the company's founder, Frederick Lunkenheimer, from 1884 to 1893 and who played an early role in the firm's growth. He was presented a plaque during special ceremonies.

NEW-TYPE BUILDING constructed to house Amaizo's starch flash dryer at Hammond, Ind. The structure utilizes a new building material known as perlite panels, precast in 20-foot lengths, 16 inches wide and 6 inches thick, they have the appearance of concrete but are actually an insulating aggregate made by expanding volcanic glass, combined with portland cement and reinforced with welded steel mesh



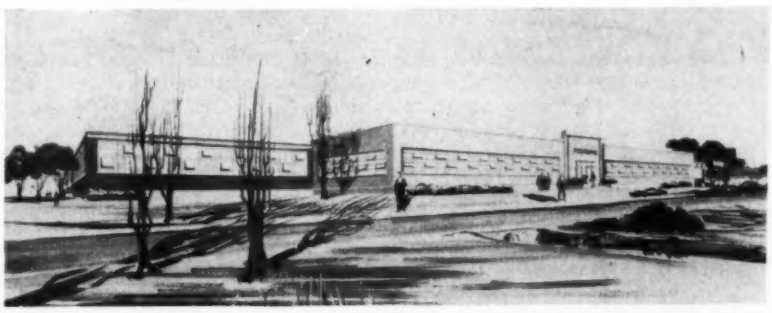
American Maize Completes First Starch Flash Dryer in United States

Starting of operation of the first modern starch flash dryer in the United States has been announced by American Maize-Products Co., Hammond, Ind. The new dryer, built almost entirely of stainless steel, marks the completion of the first step of a modernization and expansion program begun in the fall of 1951. The installation will increase the firm's starch drying capacity by more than 50 per cent.

According to Theodore Sander, Jr., president of American Maize, the plant is the first major commercial application of the principle of flash drying to starch and represents the latest techniques in the corn refining industry.

The dryer, operated 24 hours a day, will have a drying capacity of 300,000 pounds of starch per day, or approximately 90,000,000 pounds per year. At least 2,100,000 bushels of corn, a little over one-seventh of Amaizo's total annual grind, will be needed to supply this one unit on an annual basis.

Although the principle of flash drying is not new, its application to starch is a pioneer step in the development of faster, more efficient starch drying equipment. The primary difference between a flash dryer and a conventional dryer is that drying is accomplished almost instantaneously by suspending the material to be dried in a stream of hot air, at the same time subjecting it to mechanical agitation so as to eliminate any tendency of the material to lump. By exposing large surface areas of starch to hot air, evaporation of moisture is intensified and necessity of diffusing moisture to the surface of the substance is eliminated.



MODERN PLANT of Potdevin Machine Co. recently completed at Teterboro, N. J.

Potdevin Moves to New Plant

Potdevin Machine Co. has moved to a new one-story brick industrial building at Teterboro, N. J. The plant has a manufacturing space of about 102,800 square feet. Two former Brooklyn divisions are to be housed in the building, as well as the offices of the Potdevin Export Corporation.

The plant, situated on a six-acre tract, not only combines all present Potdevin manufacturing and sales operations under one roof, but provides for immediate and future expansion plans. The radiant heating system is the largest in the world.

Babcock & Wilcox Starts Texas Plant

Babcock & Wilcox Co., New York, N. Y., has announced that construction has begun on a new plant at Paris, Texas. This is the third new plant to be undertaken by the firm within a year.

The facility will employ about 750 men when in operation and will manufacture components for large utility and industrial boilers. It will also assemble smaller FM boilers, a new integral unit recently designed by the firm. Operation is expected sometime this summer. Total area under roof in the new plant will be 135,000 square feet. In addition, there will be 1500 feet of uncovered craneway.

December Pulp, Paper and Board Production

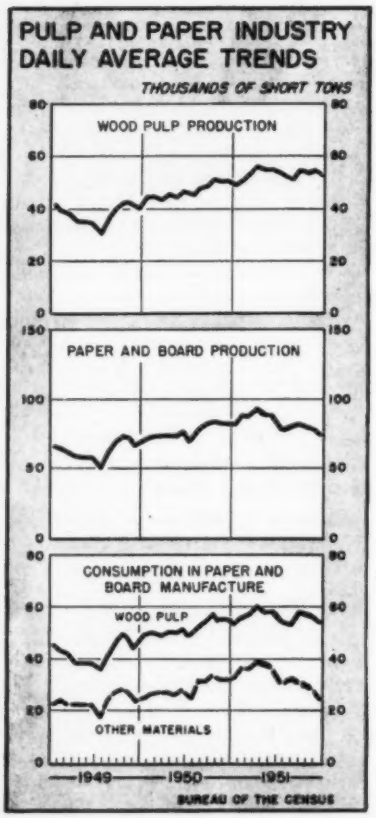
December paper and board production amounted to 1,847,520 tons, according to a report released by the Bureau of the Census. This is 12 per cent less than

the tonnage produced in December a year ago. In terms of production base capacity, the industry operated at 70.7 per cent in December, with the paper and paperboard sections operating at 86.7 and 60.5 per cent respectively. The comparable ratios for November were: Total, 75.2 per cent; paper, 87.9 per cent, and paperboard, 66.1 per cent.

Pulpwood receipts at the pulp mills during the month were 2,213,795 cords, with consumption at 2,095,206 cords. Month-end inventories increased slightly to 5,079,661 cords.

Wood pulp production during December amounted to 1,281,373 tons. In terms of production base capacity, pulp production ran at 80.9 per cent, as compared to 80.6 per cent in November.

Wood pulp inventories at the end of December at the paper and board mills were 513,547 tons, as compared to 495,913 tons reported at the end of November. Month-end stocks at the pulp mills decreased from 100,927 tons to 97,732 tons.



U. S. Paper and Paperboard Production

	Dec. 1951 (tons)	Nov. 1951 (tons)	Dec. 1950 (tons)	Total 1950 (1,000 tons)	Total 1945 tons)
Paper and board, total	1,847,520	2,048,827	2,096,834	24,300	17,271
Paper, total	952,034	990,203	915,150	10,679	7,574
Newsprint	89,883	93,246	90,184	1,017	725
Groundwood paper (uncoated)	70,252	68,052	65,633	694	636
Printing and converting (coated)	91,585	92,221	86,906	1,015	1,501*
Book paper (uncoated)	129,870	137,621	135,260	1,577	
Fine paper (writing, cover and text, bristols, thin paper and other)	118,200	122,649	104,152	1,223	1,001
Coarse paper (unbleached, kraft, glassine, greaseproof, vegetable parchment and other)	305,521	321,822	279,875	3,383	2,403
Special industrial paper	33,898	35,204	27,452	316	238
Sanitary paper	88,688	90,709	94,052	1,108	824
Tissue paper	16,309	19,404	20,150	241	157
Absorbent paper	7,828	9,275	11,486	105	89
Paperboard, total	733,482	847,420	932,572	10,804	7,907
Containerboard, total	406,775	464,483	486,986	5,646	4,131
Liners	271,378	313,757	315,210	3,690	
Corrugating material	116,334	131,330	139,958	1,637	
Container chip	19,063	19,396	31,818	320	
Bending board (folding boxboard)	206,638	237,286	(1)	2,368	2,092
Nonbending board (set-up boxboard)	46,744	59,976	(1)	641	721
Cardboard	5,289	4,957	6,493	77	71
All other paperboard	68,036	80,718	169,859[2]	2,071	891
Wet machine board	9,189	9,738	13,191	144	112
Construction paper and board, total	152,815	201,466	235,471	2,673	1,778
Building paper and insulation	70,663	97,922	122,214	1,414	883
Hardboard and insulating board	82,152	103,544	113,257	1,259	895

(*) Total for 1945, combining printing and converting paper and book paper. (1) Data not available due to revision of classifications. (2) Figure includes "Other bending board" and "Other nonbending board." *Source: U. S. Department of Commerce.*

Wood Pulp Consumption At New High

Consumption of wood pulp in the United States totaled 18,734,000 tons in 1951, 10 per cent above the 1950 record of 17,033,000 tons, according to Lawson P. Turcotte, president of Puget Sound Pulp & Timber Co.

Domestic production increased to 16,544,000 tons in 1951 from 14,776,00 tons in 1950. Exports of American-made pulp took 183,000 and 94,000 tons in these respective years, while imports added 2,373,000 tons to domestic supply in 1951, as against 2,351,000 tons in 1950. Market pulp, supply source of converting mills, totaled 4,078,000 tons in 1951, compared to 3,922,000 tons in 1950.

A change in the trend of pulp supply commencing in mid-1951 was noted by Mr. Turcotte. He pointed out that whereas in each successive quarterly period from the beginning of 1950 through the first half of 1951 an increase was recorded, a small decrease occurred in tonnage totals for the third and fourth quarters of 1951. This change was more pronounced in imports than in domestic production.

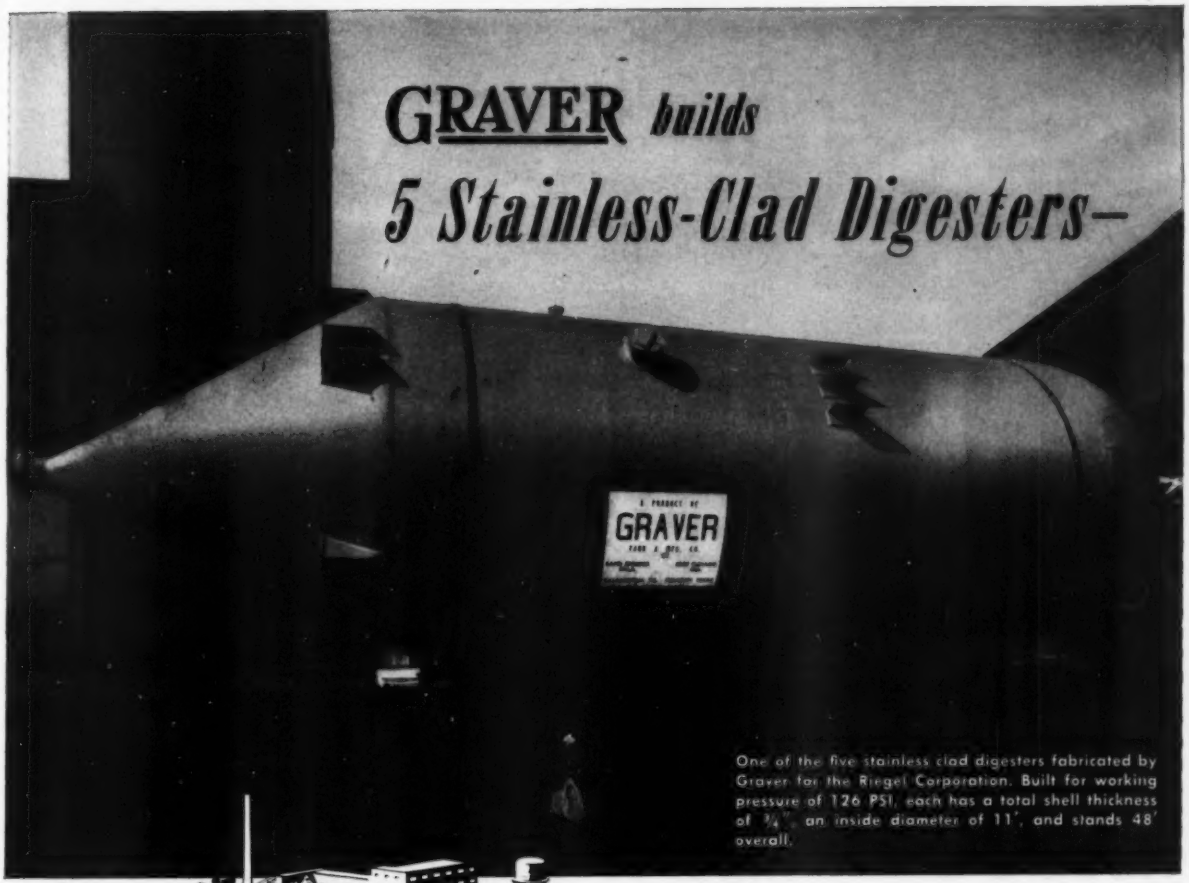
In 41 of the last 51 years new highs have been established in domestic production and consumption. Moreover, the increase has been at an accelerating rate. Pulp consumption in the U. S. has increased at the average yearly rate of 338,000 tons for the last half-century, at the average yearly rate of 639,000 tons for the last 20 years, and at the average yearly rate of 737,000 tons for the last 10 years. Last year's increase in pulp consumption was 1,701,000 tons.

United States Imports of Wood Pulp

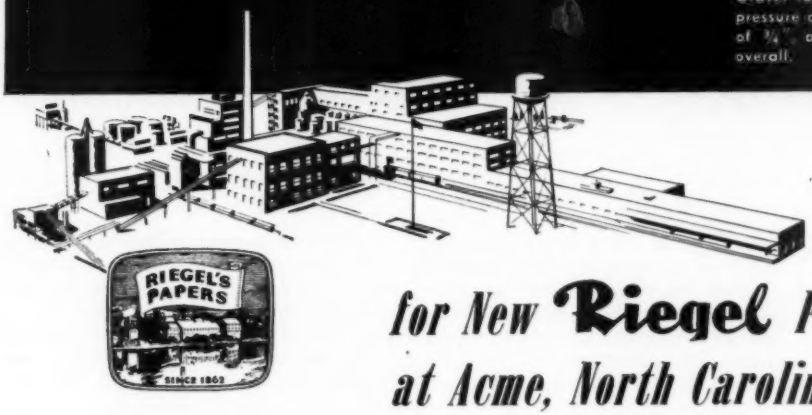
Receipts in short tons of wood pulp from Europe by country of origin.

	Sweden	*Finland*	*Norway*	*Russia*	*Austria*	*Italy*	*Czech.*	*France*	*Ger.*	*Switz.*	*Den.*	*Total*
1946	445,114	115,220	0	0	0	0	0	0	0	0	0	560,334
1947	555,215	223,973	9,577	4,928	0	0	0	0	0	0	0	793,693
1948	384,576	175,900	13,218	0	1,696	0	0	0	0	0	0	575,390
1949	265,621	148,903	29,208	0	4,459	0	1,027	0	0	0	0	449,218
1950	398,814	205,651	28,958	9,773	21,005	167	2,597	115	977	89	0	668,146
1951	257,061	182,616	36,365	0	3,225	0	512	106	2,812	89	15	482,801

GRAVER builds 5 Stainless-Clad Digesters—



One of the five stainless clad digesters fabricated by Graver for the Riegel Corporation. Built for working pressure of 126 PSI, each has a total shell thickness of ¾", an inside diameter of 11', and stands 48' overall.



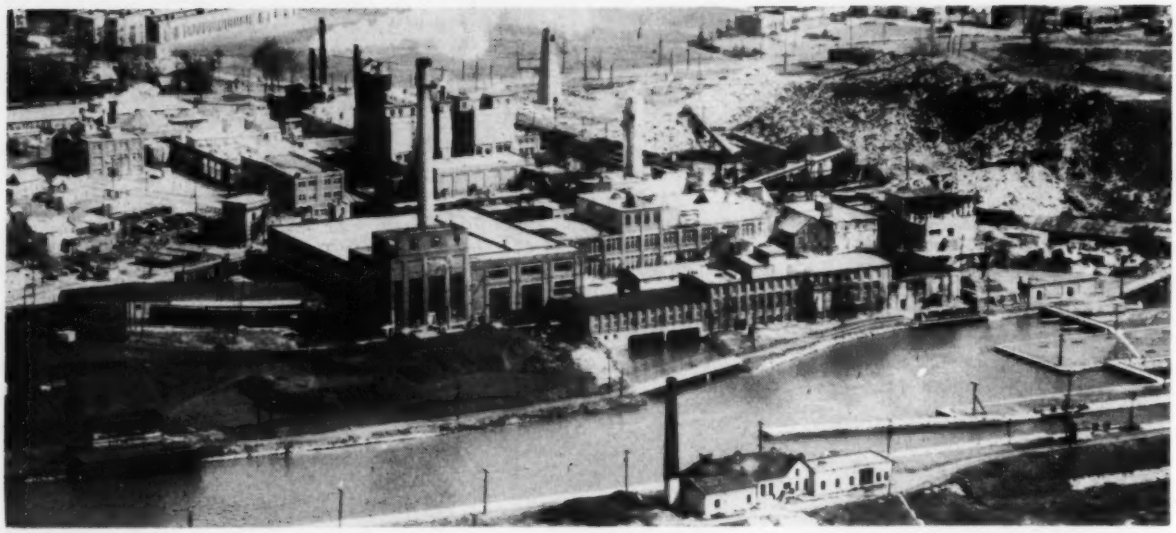
A leader in paper making since 1862, the Riegel Corporation produces more than 600 different kinds of paper, with glassine and greaseproof papers its largest lines. The recent addition of a pulp mill permits Riegel to integrate its every operation from tree to finished paper.

for New Riegel Pulp Mill at Acme, North Carolina

The vital part these five digesters play in Riegel's new pulp mill demanded fabrication of the highest order. Top efficiency, long, dependable service, and minimum down-time were "musts". By intensive research and painstaking fabrication, Graver's goal was not only the fulfilling of these requirements, but in addition the elimination of other operating problems inherent in the usual digester. These very real evidences of Graver ability are worth remembering whenever fabrication in steel or alloys is *your* need.

GRAVER TANK & MFG. CO., INC.
EAST CHICAGO, INDIANA
NEW YORK • CHICAGO • PHILADELPHIA • DETROIT • WASHINGTON
CINCINNATI • CATASAUQUA, PA. • HOUSTON • SAND SPRINGS, OKLA.

GRAVER



AERIAL VIEW shows scope of Howard Smith Ltd.'s Cornwall Division

New paper machine added as . . . .

Howard Smith expands Cornwall Division

A. W. J. DYCK, Ph.D.
Consulting Editor

With the recent installation of Canada's largest fine-paper machine, Howard Smith Ltd.'s Cornwall Division, Cornwall, Ont., has furthered its position as a leader in the Canadian pulp and paper industry. Daily production at Cornwall is now 175 tons of bleached sulphite, 150 tons of bleached soda pulp, and 150 tons of such paper as sulphite bonds, ledger, book, stationery, patent-coated carton boards, food containers, blanks, covers, and bristols.

The newly-installed machine, equipped to make various types of paper in varying thicknesses, delivers sheets of paper within specified thickness tolerances of plus or minus 0.0005 inches. In operation it turns out a ribbon of fine paper more than 12 feet wide at an average speed of 12 miles an hour.

The wet end of the new machine, built by Canadian Vickers Ltd., is a removable fourdrinier with an 85-foot long and 162-inch wide wire screen. The headbox has a Bertrams flow-distributor and a Neilson slice. All fourdrinier parts are made of stainless steel. Three Sutherland refiners and one Hydrafiner are among the equipment used in stock preparation. Before entering the fourdrinier, the pulp suspension has to pass through special screens to remove clumps and oversize fibers.

The dry end of the machine, constructed by Dominion Engineering Ltd., consists of two suction presses, one smoothing press, 26 drying rolls, each measuring five feet in diameter, six felt dryer rolls, and a calender section.

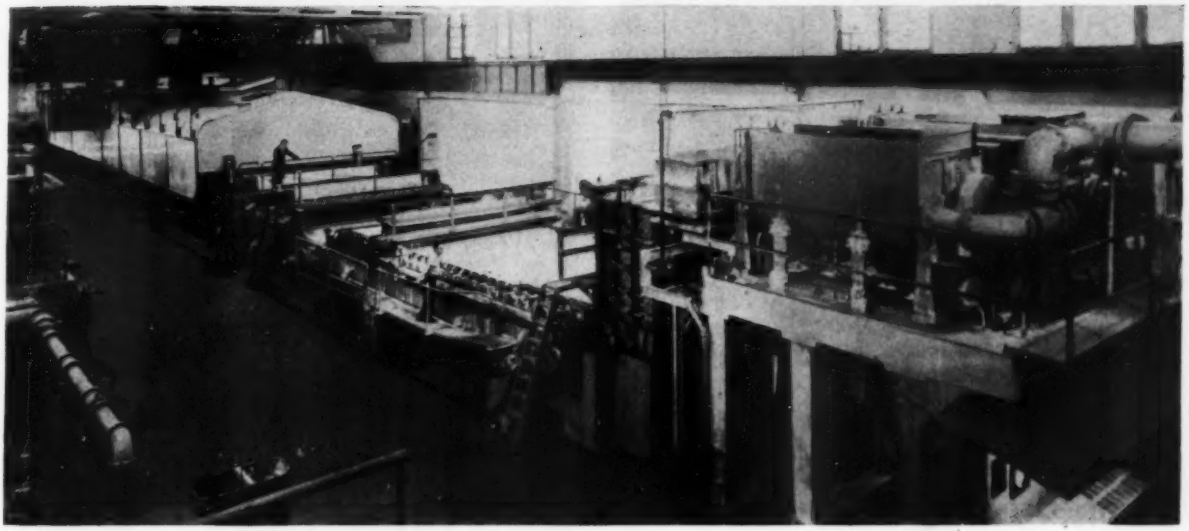
All planning and installation, including the assembly of the machine, was carried out by the company's own staff, assisted by L. H. Schwindt & Co., an engineering firm in Burlington, Ont., which furnished the design of the re-

Operating Personnel

H. E. Mason
Gen. Supt. and Manager

C. N. Candee
Assistant Manager

W. P. Nesbitt
Production Manager



WET END of new paper machine recently installed at Cornwall

One of Canada's fast-growing manufacturers, Howard Smith Ltd. has expanded from one small paper machine in 1912 to 17 units in nine mills today. In addition, the firm controls a tenth mill operating three paper machines and a building board plant, and it owns and operates facilities for producing laminated plastics. The Cornwall Division, originally Toronto Paper Co. Ltd., was acquired in 1919.

inforced concrete foundation and floors.

While the installation of the new paper machine constitutes the most spectacular addition to the company's paper manufacturing equipment, it represents only part of the $7,500,000 five-year expansion program started in 1947.

Five-year Program

Among other developments completed under the five-year program are:

(1) Provision of adequate supplies of water and power, and the creation of more room for expansion.

(2) Stepping up production with existing facilities. This entailed a reduction of the cooking times of soda pulp and sulphite pulp. In the paper mills various modifications were made to enable machine speed-up.

(3) To restore operating efficencies at the increased rate of production, two Sveen-Pedersen save-alls and a Waco filter were installed. The chemical recovery system was enlarged by installing 28 x 12 Sherbrooke washers, a Tomlinson B&W recovery furnace, and a seven-stage Swenson black liquor evaporator. In the sulphite plant a new sulphur melter was provided and the combustion chambers completely redesigned.

(4) Additions to production facilities involved the construction of a new steam plant and extensive modernization of Nos. 2, 3, and 5 paper machines.

(5) Direct expansion in pulp and paper production included the erection of three additional soda pulp digesters, bringing the total number to six. To provide the necessary increased wood supplies, a new Ingersoll-Rand "Weldrum" barking drum was installed, as well as Carthage chipper, Tyroc chip screens, and a chip conveyor to the soda mill. To bleach the additional pulp, a newly designed bleach plant with a capacity of over 250 tons had to be built.

Many Woods Used

With the completion of the expansion program toward the end of 1952, almost any type of hardwood will be used at the Cornwall Division. The company is already accepting such hardwoods as maple, elm, birch, ash, and oak—in addition to poplar, which has been used for some time in soda pulp manufacture. Equally revolutionizing, it is understood, will be the introduction of a new process that will eliminate mechanical debarking operations.

Among the men who figure prominently in Howard Smith's expansion program are: H. E. Mason, mill manager; C. N. Candee, assistant mill manager; F. B. Bjornlund, pulp production manager; W. P. Nesbitt, production manager and H. E. Mead, plant engineer.

With an extremely active central research department at the Cornwall Division, under the direction of Dr. G. H. Tomlinson II, the company is equipped to remain in the vanguard of new developments. The entire research department is said to operate on the proceeds of royalties paid by pulp and paper mills using patents developed by the research department. Taking this as a measure of the pioneering spirit that pervades the company's research men and management, it is not surprising that Howard Smith was the first Canadian company to install a Rittner-Kellner mill (in 1888). It was first to erect a soda pulp mill, first again to operate vanillin and lignin plants, and first to produce Arborite board.

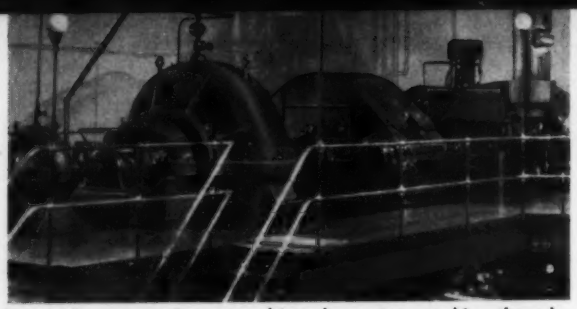


Fig. 1—Large capacity pump driven by a steam turbine through reduction gears; small pump at end of main pump supplies circulating water to turbine condenser

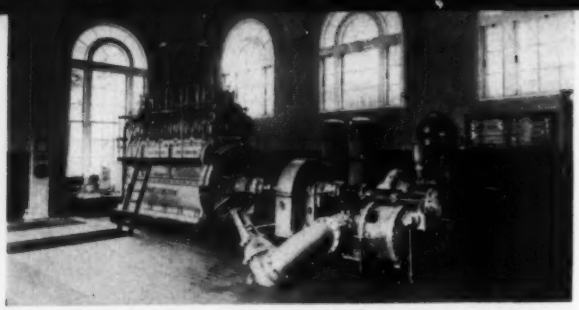


Fig. 2—Pump driven by a slow-speed, heavy-duty diesel engine; for such installations, step-up gears are utilized as speed changers, prove satisfactory

Centrifugal Pumps

Factors involved in selecting pump drivers

Part 19 of a Series

IGOR J. KARASSIK and ROY CARTER
Application Engineers
Worthington Pump & Machinery Corp.

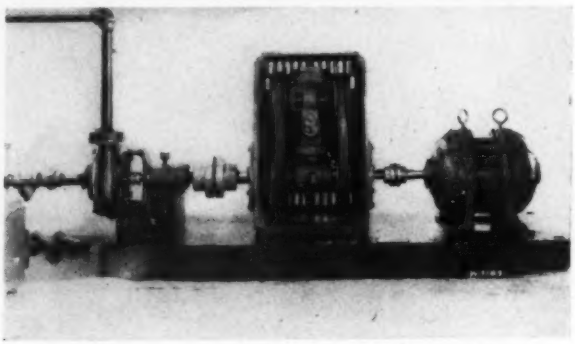


Fig. 5—Variable speed transmission provides for variable pump output; (cover removed from drive to show construction, employing V-belts and adjustable pitch sheaves)

Most centrifugal pumps are electric motor-driven. Steam turbines, either direct connected or geared, are often used. Gasoline engines, diesel engines and gas engines are less common. Water turbines are occasionally used. Steam engines are rarely used with modern centrifugal pumps but were formerly used to a considerable extent. Probably every form of prime mover and source of power has been used, with some form of intermediate transmission if necessary, for centrifugal pump drive.

The choice of rotative speed is limited with certain types of drivers like gasoline engines. Thus, the speed for the ideal pump for the service conditions may be much higher or much lower than the driver's speed. For units to be used constantly, a speed increasing or decreasing device is warranted. For units to be used occasionally, such as a standby unit, a compromised pump design can often be used, thus saving the cost and complication of a speed changer at some sacrifice in pump performance and in some cases with increase in pump costs.

Driver size

There are a great number of local conditions which affect the permissible loading of the various types of drivers. In the case of an electric motor, the safe load which can be carried by the motor depends on its inherent design, as well as on the temperature and density of the surrounding air and on the variations in current characteristics. Other types of drivers are also affected by local conditions. In all cases, the driver should be capable of carrying the loads that will be imposed on it over the entire range of pump operating conditions, with the most adverse operating conditions for the driver.

Where the driver is suitable for variable speed operation and where the installation requires operation over a wide head range for which, consequently, a wide range of power is required, advantage is sometimes taken of running the unit at reduced speed to keep the maximum power requirement within the available driver size.

Factors affecting size of driver

The power required to drive a centrifugal pump from shut-off to maximum capacity varies with its specific speed type and its individual design. In the lower specific speed types, the power requirement is minimum at shut-off and increases to a maximum at or near maximum capacity. With this type of pump, operation at heads below normal will result in increased power requirement and in some cases will impose an overload on the driver.

On the other hand, high specific speed types have the reverse power requirements, and a reduction in head causes a reduction in power. In a pump of such high specific speed type, an increase in the operating head will cause an increase in power consumption and, in some cases, may overload the driver.

Motors—Operation of a centrifugal pump under conditions where the brake horsepower exceeds the safe operating load that can be carried by the motor is definitely dangerous, because the motor may be injured or burnt out. Electric motors have certain permissible loadings depending on the type of motor. Whether a pump may or may not exceed the safe loading of its electric motor depends on the shape of the power characteristic curve and on the system head characteristics.

Steam Turbines—In case a centrifugal pump is driven by a steam turbine there is no danger of overloading the turbine. This is due to the fact that, with a fixed throttle position, a steam turbine basically develops a constant torque, and the speed of the unit will always be at a point where the turbine torque equals the pump torque. Thus, if the turbine is equipped with a constant speed governor, the latter will throttle the steam supply until—at the required speed—the developed torque and the torque demand are balanced. With an increase in torque demand, the governor will open the throttle valve until such a point is reached where the torque demand tends to exceed the available torque.

Since the governor can no longer provide for the steam required for a torque increase, the turbine slows down until a balance is reestablished between the demand and the available torque at some speed lower than the design speed.

The process that occurs when the turbine is equipped with a constant or excess pressure regulator is identical to the one described for a constant speed governor, the only difference being in the

Material from this article will be included in a book on centrifugal pumps now being prepared by the authors; hence, all rights to republications are reserved by the authors.

Fig. 3—High pressure boiler feed pump with a step-up gear that permits driving the pump at 4150 rpm, using a 1450 rpm motor

Fig. 4—Dual drive pump is normally electric motor-driven; gasoline engine to the right is used only in case of power failure

source of the impulse which tends to maintain the required torque balance until conditions external to the governor arise to interrupt its functioning.

A turbine driving a centrifugal pump should be of a size that will permit it to carry the maximum load that will be imposed on it by the pump with the most adverse steam conditions. These can be determined fairly accurately in large units but not as accurately in small units. It must be remembered in the case of a turbine-driven unit that, as wear causes increased leakage through the wearing rings, the pump capacity will be reduced, so that it is desirable to speed up the pump slightly to obtain the desired output. Generally, smaller pumps are not checked as carefully as large pumps, and the leakage becomes more pronounced before the leakage joint is restored to its original clearance. Thus, in smaller steam turbine-driven units, the turbines are generally selected for some excess power (roughly 5 per cent over maximum expected loading), while in larger units turbines are selected for a rating equal to or slightly in excess of the maximum loading.

Internal Combustion Engines — In some cases, power ratings of internal combustion engines are given for the load they can carry continuously at the rated speed, while in other cases ratings are given for the load the engine can develop on test with full open throttle. In the latter category these power ratings may or may not include the power required by the normally attached auxiliaries, such as the circulating pump, fan, etc. Engines of the automotive type are generally rated for their maximum developed power on dynamometer test while stripped of all auxiliaries. Such engines can usually be safely operated with a continuous loading of 75 to 80 per cent of their developed power.

Most automotive engines are of the high speed type and have a very limited life when used for continuous operation. There is also available both medium-speed type engines giving a longer life and the low-speed type having a very long life with a minimum of maintenance.

While most internal combustion engines rated on the basis of the load they will carry constantly will also carry an overload, and while engines rated on the basis of maximum developed power can be operated while loaded to a higher percentage of that developed power, such operation, if other than momentary, will generally result in mechanical failure.

The type of engine best suited for any particular application must therefore be selected with due consideration to the service requirements.

Variable speed drives

When varying operating conditions exist in a centrifugal pump installation, variable speed operation may be desirable, and drivers which economically permit speed variation are preferred for such installations. The choice of drivers suitable to variable speed operation is quite wide: besides steam turbines, gasoline or diesel engines, it is possible to use slip ring wound rotor motors or, in certain cases, d.c. electric motors. Even when synchronous or squirrel cage induction motors must be used, it is possible to apply a variable speed transmission, such as the hydraulic or magnetic transmission, or in case of small power, variable speed devices using variable pitch sheaves and V-belts; (see Fig. 5).

Advantages of Variable Speed—There are a great number of centrifugal pump applications where operation at varying capacities and/or total head may be required. Since the operating conditions of a centrifugal pump are determined by the intersection of its head-capacity curve with the system head curve, the only means available for varying operating conditions is the alteration of the system head curve by means of throttling if the pump is operating at constant speed. In many cases it may be more practical, and certainly more economical, to change the intersection point referred to above by varying the operating speed and, hence, the head-capacity curve of the pump.

Many factors enter the evaluation of the most economical method of operation under such conditions. While considerable horsepower may be saved in varying the speed of a steam turbine or of an engine, it must be remembered that the efficiencies of slip ring motors and of hydraulic and magnetic transmissions are practically proportional to the ratio of their operating speed and full load speed. The actual power consumption must be considered in the evaluation, along with the increased cost of the drive over a constant speed drive. Finally, in some applications such as boiler feed service the head loss through throttling is converted into usable heat gain, and this must be taken into account in a thorough evaluation.

Dual drives

By a dual driven pump the pump profession means one which is arranged so it can be driven by either of two drivers. Generally, the two drivers are of different types, one being for regular use like an electric motor and the second being a standby type like a gasoline engine for use in case of power failure; (see Fig. 4).

Dual drive units are generally arranged with a driver on each end of the pump so the driver not being used can be disconnected. It is necessary with this arrangement to have a double extended pump shaft, and end suction pumps cannot be used.

Two drivers sharing total load

A few installations exist in which the pump is driven by two drivers each carrying part of the load. The most common installations of this type involve an electric motor and a water or steam turbine. For such an application water turbines without governors or with governors set at a higher speed are used, and, in case of induction motors, the speed of the unit varies slightly with changes in operating conditions in order to reach a balance in which the power developed by the two drivers equals the power required by the pump.

Belt drive

In the early days of centrifugal pumps, before electric drive became so universal, many isolated pumping plants were steam operated with steam engines for drivers. There were many cases where the speed of the pump could not be matched to the engine speed, and the engine drove the pump by means of a flat belt with different diameter pulleys to give the correct pump speed. There is now little demand for flat belt driven pumps, except in small sizes, and for irrigation pumps which are belted to tractor engines.

Multi-V-belt drives are used quite

often for centrifugal pump drives. In some cases the pump is an auxiliary such as cooling water pumps for diesel or gas engines. Occasionally there is an application where multi-V-belt drive can be used as a speed increasing or speed decreasing transmission to connect a driver to a pump operating at a different speed. In multi-V-belt drives provision has to be made so that the belt tension can be adjusted, and also so that sufficient slack can be provided in order that the belts can be put on the sheaves. As the location of a pump is usually fixed because of its suction and discharge piping, this adjustment must be accomplished by moving the driver or, if that is impractical, by introducing an adjustable idler pulley.

Gear drives

It frequently occurs that the logical range of pump speed does not match the logical or possible range in speed of the driver. These conditions exist in the case of most steam turbine-driven pumps (see Fig. 1) other than for low capacity and high heads and in the great majority of units driven by heavy duty diesel and gas engines (see Fig. 2). For such installations, gears are used as speed changers and are very satisfactory.

Gears connecting horizontal shaft drivers to horizontal shaft pumps are usually double helical single reducing or increasing gears. There is also considerable application of right angle gears to connect horizontal shaft drivers to vertical shaft pumps. These drives were basically developed for engine-driven deep well turbine pumps and are capable of carrying a large downward thrust load on their vertical output shafts. Most gears of these types are of the hollow shaft type favored in the deep well turbine pump field.

Paper Mill Power—Part XI

The Human Factor

DAVID MOFFAT MYERS
Myers & Addington, New York

THE HUMAN FACTOR covers a multitude of sins. For after the plant has been installed, the only control of its efficiency is through the men who run it, including all degrees of responsibility, from the president down to the humblest operative. That goes not just for the power plant, but for the whole paper mill as well.

This derives from the formula: Efficiency = E × H, in which E is the maximum efficiency of which the equipment is capable and H the efficiency of the man behind the machine.

Losses due to this factor may include those connected with inefficient maintenance and operation of boilers, turbine units, or auxiliaries; wastes from steam traps, bad insulation, unreturned clean condensate; escape of steam through relief valves; failure to utilize exhaust or extraction steam to replace direct steam; and others connected with a very long list of detailed items.

It is necessary to know what standard can be established as the best possible performance for the existing plant. This applies equally to a new plant or an old one. Devise the most efficient heat balance that can be attained with the units available.

Then compare the actual operation to that standard, and analyze the losses that account for the difference. If you need help, you can get it. Just as you can buy any kind of equipment, you can as easily purchase correct independent information and assistance. This latter should be obtained before, not after, costly commitments are made for "improvements."

Know the results

To follow such a program successfully, you need to know *what* results you are getting; and, where they fall below par, you must find out *why*.

For example, accurate metering of steam flow, pressure, and temperature; feedwater temperature; Btu of fuel, and its consumption will enable computation of boiler and furnace efficiency. Compare this to the design efficiency. If it falls below, then find out why.

The reason may be comprised of a number of items, all correctables: Excess or insufficient air supply determined by gas analyses; a dirty boiler inside or out indicated by excessive flue temperatures; air leakage through the setting checked by gas analyses; wrong loading of boiler checked by steam flow meter; furnace, burners, or draft control out of repair checked by draft readings and inspection; fuel below par or not suited to furnace design checked by analysis and design data. And so on through the list.

If the present instrumentation is not adequate, then make it so at once. For without knowledge of results and their causes, the plant is running blind and is sure to be wasteful.

Good balance

The present heat balance should be determined and improved as far as possible with existing units. The maximum power yield should be secured from manufacturing steam by all possible use of exhaust or extraction steam to save direct or reduced pressure steam from the boilers, thus also cutting down on steam to condensers. The most effective division of load among the various generating units is of utmost importance for a good balance. All units must be maintained in as nearly perfect operating condition as possible.

The consumption of steam, power, and water should be measured as used by each department of the works and studies made in each for stoppage of unnecessary waste.

Space limitation forbids going into further detail, but such procedure properly pursued definitely affects the cost of a ton of paper. The first requirement is to cultivate a spirit of close cooperation and understanding between departments, management, and operatives. It is very common to find a lack of these qualities between the power department and some production department. Complaints may be made that demands for steam and power are not met amply and quickly, while at the same time the power engineer may know of correctable wasteful practices by those who control the use of these utilities. Such a case calls for close cooperation for an economical solution of the problem.

Competition

It is the practice in some well-run paper mills to establish a system of awards, prizes, or bonuses for the purpose of arousing and maintaining continued interest in efficient operation, not only of the power plant, but of all departments. Such plans carefully devised have proved highly beneficial to all involved.

As far as their application to power and steam is concerned, it is necessary to include in the system all those individuals in any part of the mill who control the actual consumption of the utilities, as well as those responsible for their production.

By improvement of the human factor alone, without capital expenditure in power plants, I have seen efficiencies improve by as much as 5 to 40 per cent.

We have expended untold time and money to improve our machines, which have achieved a high efficiency in performance and production.

A proportionate effort in brains and wealth and good will devoted to the improvement of the human side of the equation in our plants and in our world holds the promise not only of increased efficiency, but of ultimate peace and contentment.

OVER-ALL VIEW shows portion of Brunswick Pulp & Paper's Georgia operations

Modernization in Georgia as . . .

Brunswick expands mill capacity

IN JUNE 1950 the Brunswick Pulp & Paper Co. operating management presented to its principals a plan for increasing the daily capacity of its mill from approximately 290 tons per day to 400 tons per day. The mill was originally designed in 1937 for 150 daily tons, increased in 1940 to 200 daily tons, and later stretched to 245 tons per day. In 1948 a 45 ton expansion program was completed, which brought the rated capacity of the mill to 290 daily tons.

As the mill, since its inception, has been a pioneer in the handling of bleached sulphate pulp from southern pines and hardwood, quite naturally each stage of the modernization program brought about certain bottlenecks and inefficiencies.

The expansion program just completed was designed as well as possible to produce pulp at 400 tons per day on an efficient and economical basis with first emphasis being on quality.

About the time the program was presented to Brunswick's principals for approval, the Korean War started. This posed many problems of a serious nature, but after due consideration the board of directors authorized procedure with the job in July 1950. Chas. T. Main, Inc. of Boston was selected as consulting engineers for the job, and in early August 1950 purchase of equipment and design work began. The Brunswick management, realizing the need for increased pulp because of the Korean conflict and defense needs, early in the program set August 1, 1951, a period of 12 months from the time of design work and purchases started, as the completion date for the job. Special emphasis was placed on the fact that the mill could not be shut down for tying in new equipment and in addition, production must be maintained at then current rates, if not increased.

By December 1950, sufficient design work had been done by Chas. T. Main, Inc., and sufficient equipment received in order to start construction work. However, for all practical purposes, no construction of any measure was started before January 1, 1951. Exactly seven months and one day later production at the 400 ton rate was achieved. The mill is now operating at the 400 ton rate, and on many days shows production in the range of 425-450 daily tons.

Tidewater Construction Co. of Norfolk, Va., served as the contractor for the driving of all piling, erection of steel, construction of buildings and set-

Brunswick Mill Personnel

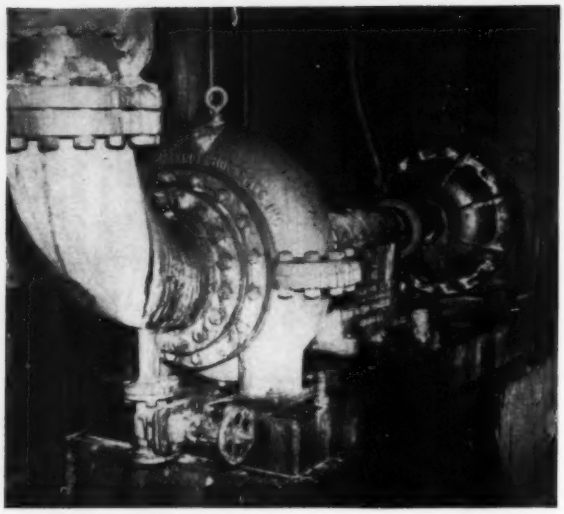
E. J. Gayner III
President

J. W. McSwiney
Asst. Sec.-Treas.

G. K. Singletary
Plant Manager

W. W. Krauss
Plant Engineer

Woodyard production increases with the installation of a 10-knife D. J. Murray chipper



Equipment on each of the four new digesters includes Fibre Making Processes circulating systems

ting of equipment. Rowland Tompkins & Son, Inc., of New York was the piping contractor, and Rollinson Engineering Co. of Savannah, Ga., served as electrical contractor on the job. These three principal contractors were served by many subcontractors. However, all three were coordinated in the field by the Brunswick operating management and field engineers of Chas. T. Main, Inc. A remarkable degree of cooperation and work performance was achieved by all the three general contractors and at no time did conflicting interests arise where one general contractor was at loggerheads with another. During January, 1951, it was apparent that the job could not be completed by August 1, 1951, unless a detailed schedule of all work to be done was worked out so that each contractor would know specifically at what dates specific work was to be done and what type trades would be employed in so doing. The significance of this can be drawn from the fact that at the peak of construction the contractors had in excess of 500 trade employees in the Brunswick Pulp & Paper Co. plant working throughout the entire operations. At no time did these trades seriously interfere with the operation of the plant. In fact, average daily production of the mill was increased some 15 to 20 tons per day during the construction period. After the completion of the detailed construction schedule, by trades, each general contractor was aware of the magnitude and scope of his job and the time to be allocated to each phase. Many laborious hours were spent in exploring ways and means whereby two jobs could proceed in the same area at the same time. The result of all these discussions was fruitful as will be noted by the completion of the construction schedule as outlined some eleven months previous.

The scope of the work originally was estimated at some $5,250,000 and is currently estimated to be slightly in excess of $6,000,000. Increased equipment cost and labor cost plus larger electrical and mechanical changes than originally envisioned caused the increase.

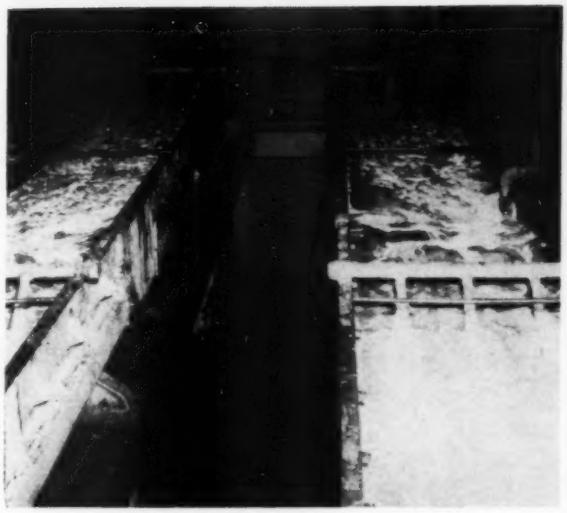
Wood preparation

One new 80 D Northwest crawler crane with 80 ft. boom was added to the two existing Northwest cranes, making a total of three for the handling of wood from cars to the yard or from the yard to the conveyor and into the mill. No change was made in the conveying equipment. The mill had previously operated its woodyard 96 hours per week in producing 290 tons of pulp daily. The 400-ton plant calls for operating the woodyard 112 hours per week, an increase in operating time of 11.6 per cent as compared with approximately 40 per cent increase in production. Production per woodyard hour operation has been increased by the installation of a new 10-knife Murray chipper to operate along side a 10-knife Carthage chipper installed in 1947. Only one chipper will be operated at a time, but as knife change time will not be a factor with two chippers and as the throat of the new Murray chipper is designed to prevent plugging, the increased production has been attained without great difficulty. Additional chip storage space was secured by simply raising the discharge conveyor over the existing chip bin about five feet, thus allowing the chips to be stored to a higher level in existing bins.

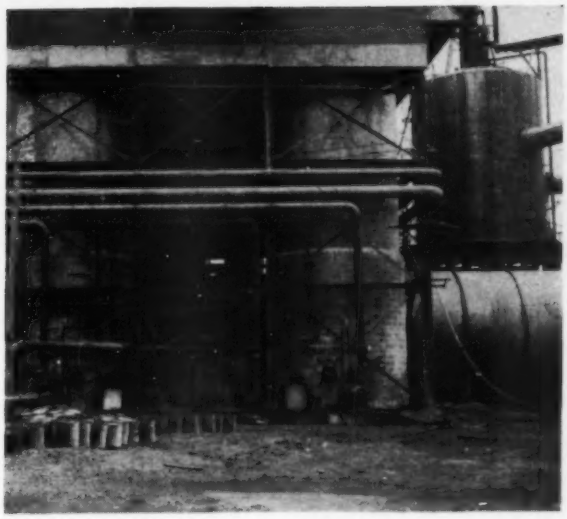
Electrically, the wood preparation is fed through three 500 KVA Wagner single phase transformers 4160/480 volts. A modern filtered air ventilated control room houses all electrical controls, principally Westinghouse type "C" construction low voltage control centers. The two 10-knife chippers are driven by 400 HP, 4160 volt, 3 phase, 60 cycle, 450 RPM G.E. wound rotor motors, directly connected, through flexible coupling, to chippers. Permanent resistance is left in Rotor circuit to give approximately 11 per cent slip.

Digesters

Four new M. W. Kellogg Co. digesters were added to the existing six. The original digesters are of 3800 cu. ft. capacity, as are the new digesters. However, the capacity has been cut approximately 10 per cent by the installation of carbon linings by Stebbins Engineering and Mfg. Co. of Watertown, N. Y. The six old digesters, four of which had been in since the mill was installed in 1937, were showing signs of corrosion to the point where it was necessary to either line these digesters or shortly give consideration to replacing them. It was decided to line the four new digesters in order to prevent any corrosion problem and also to allow leeway for any type of cook that might be desired. Each of the new four digesters have circulating systems of the Fibre Making Process type. Automatic digester controls are installed on the four new digesters as had previously been installed on the old six. The automatic digester controls were furnished by Bristol. The automatic digester controls have given good service. Steam consumption has been reduced, and the uniformity of the pulp produced has been increased. A new blow tank was installed after the four new digesters, and the digester repiped, so as to



Screen room equipment newly installed in the modernization project includes IMPCO brown stock flat screens



Brown stock high density storage chests, designed by Stebbins Engineering; agitating equipment by IMPCO

put five digesters into existing blow tank and five digesters into new blow tank.

Electrically, the digesters are fed through 1000 KVA unit substation and type "C" low voltage control centers located in filtered air control room.

Brown stock washers

The largest single phase of the expansion program was the construction of an entirely new wash room. The then existing wash room was entirely outmoded and offered no hopes of modernization to produce 400 tons of pulp.

The operating floor of the new wash room is located at the same level as the digester operating floor. Two lines of 8x12 Oliver brown stock washers were installed, three washers to each line, with a rewasher installed at the end of each line. The rewashers were taken from the old wash room and are of the Oliver type construction. Included as a part of the new wash building are two hi-density storage chests, one after each line of washers, 18 ft. dia. and approximately 45 ft. in height. These chests hold a storage of approximately three to four hours at the 400 ton rate. Liquor seal tanks are of the horizontal type, 18 ft. dia., the longest being 100 ft. and the shortest being approximately 70 ft. The new wash room has full instrumentation, flowrators measuring the flow of stock to each line of washers, and flow indicators controlling dilution on all washers, along with automatic level controls on all seal tanks. The rewashers deliver the washed stock to two hi-density storage chests from whence it can be drawn at desired rates by the screen room. Desired consistency is obtained by use of DeZurik consistency regulator. The mechanism for taking the stock out of the bottom of the hi-density storage chests was furnished by Improved Paper Machinery Corp. and has worked very satisfactorily.

Electrically the wash room is fed through two 1000 KVA unit substations, type "C" construction low voltage control centers with filtered air control room. All washers are driven by G. E. variable speed dc drives. All stock moving units are electrically interlocked.

Screen room

The original screen room contained six rows of flat screens of three sections each, three rows of two sections each and two tailing screen rows of three sections each. Accepted stock was deckered over two 6x8 Oliver deckers and one 8x12 Impco decker. In order to increase production to 400 daily tons five additional rows of flat screens of two sections each were installed, an additional section installed in each of the three existing two section lines, and one of the 6x8 Oliver deckers was replaced by an 8x14 Impco valveless decker. From the hi-density chest stock is drawn by means of a remote controlled valve at a pre-determined rate. The screen room operator controls the flow into a blending chest at about 3½ per cent consistency. From the blending chest, stock is pumped into the suction of a fan pump. The outlet of the fan pump is divided into two discharge lines, each entering opposite ends of a head box at the head of the screen room. The discharge into each end of the head box is controlled by remote control valves under the control of the screen room operator, and as the volume of the stock delivered to the fan pump is fixed from time to time, a variance in the opening of the control valves into the head box will either decrease or increase the consistency of the stock being delivered into the head box. Stock from the head box on to the flat screens is controlled by valves, so that stock can be allocated over the screens as desired. Tailings from the two tailing screens pass over an Impco vibration screen, and the reclaimed fibre is pumped back to the screen head box. This equipment minimizes the effect of surges on the tailing screen and resultant stock losses.

Accepted stock from the screen room is stored in three brown stock storage chests at 3½ per cent consistency prior to delivery to the bleach plant.

Electrically, the screen room is fed through a 1000 KVA bank unit substation, type "C" low voltage control centers in modern filtered air control room.

Bleach plant

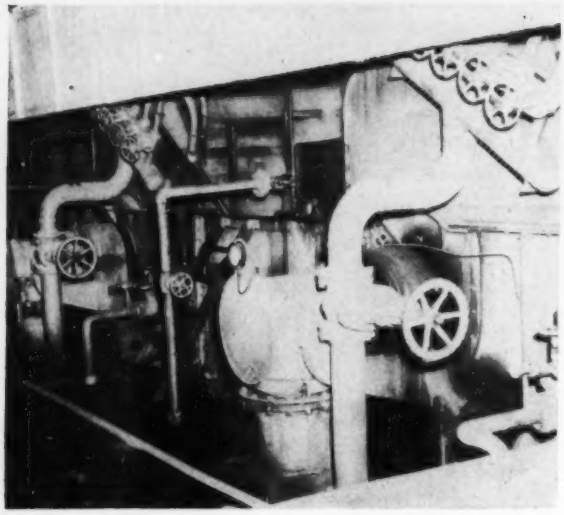
Prior to completion of the 400-ton expansion program, Brunswick's bleach plant had been operating since its inception in 1937, with the exception of the first and second stage washers, on 6′x8′ pulp bleaching washers. It was decided early in the program that all of these washers would have to be replaced and, with the exception of the first stage in the bleach plant, now all washers are 8′x16′. The bleach plant now consists of:

First stage—two 8′x12′ rubber covered Improved washers for the acid chlorination stage.

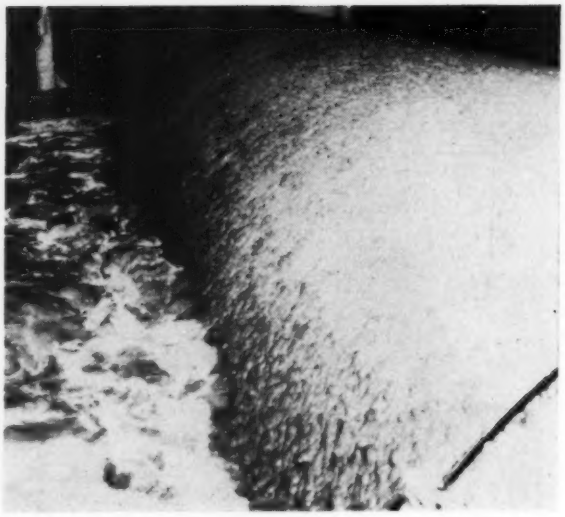
Second stage—8′x16′ Improved washer discharging its stock into Kamyr hi-density hypo towers.

Third stage—one 8′x16′ Oliver washer from whence stock is dumped into two hi-density caustic towers of the Kamyr type.

Fourth stage—one 8′x16′ washer from



Two lines of Oliver brown stock washers were installed, three washers to a line



IMPCO 8 by 14 valveless decker replaced smaller 6 by 8 Oliver decker

whence stock is discharged to 10 Fletcher bleachers.

Fifth stage—stock from the Fletcher Bleachers is thence put over an 8x16 final Oliver washer where it is discharged into an SO_2 soaking tower prior to delivery to the machine room.

Improved mixers are employed after the second, third and fourth stage washers to give good temperature and chemical mixing control. One 8x12 rubber covered Improved washer was retained along with the one 8x16 washer in the No. 2 stage. The new bleach plant will be controlled from a control room fully air-conditioned and at a level above all the washers. The operator will be able to start and stop all equipment, control all vat levels from the control room without leaving it. He will also be able to observe the function of all washers without leaving the control room. This step was taken in order to prevent deterioration of the electrical equipment and meters and instruments by bringing in only conditioned air to the point of operation. It is also a means of providing good working conditions for the operators during the maximum period possible. It was recognized that the whole area could not be conditioned, but that a small localized area might be successfully handled. To date the plan gives promise of being an outstanding success.

Electrically, the bleach plant is fed through one 1500 KVA and two 1000 KVA unit substations, type "C" low voltage control centers in filtered air control room. All stock moving units are electrically interlocked.

Machine room

Brunswick had in existence prior to the expansion program one Rice-Barton 156 in. fourdrinier machine with sixty 5 ft. dryers and one 156 in. Kamyr wet machine and flakt dryer. The fourdrinier was originally rated at 150 tons per day when the mill was built and during the 1950 expansion program it was raised to 200 tons per day. The Kamyr wet machine is rated at 175 tons per day by the manufacturer. It was believed by the operating management that these two machines could be stepped up sufficiently to average 400 tons of daily production. At this writing, it is evident that this can be done as peaks of 250 tons per day have been achieved on the Kamyr wet machine, and rates up to 225-235 tons per day have been achieved on the fourdrinier type machine. Admittedly, however, this is a tight point in the mill's operation.

A new 1000 KVA unit substation type "C" construction low voltage control center was installed to modernize the distribution to No. 1 machine. There was a comparable control room existing for No. 2 machine installed in 1947.

Shipping facilities

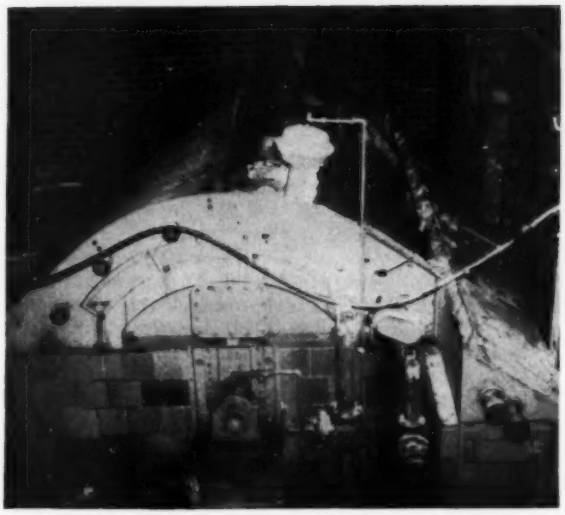
When the mill was built in 1937, it was necessary to take the pulp up an inclined ramp to get the pulp into box cars. This over the years proved to be a very costly item from a maintenance standpoint of trucks and equipment and also time consuming in loading cars.

A new loading shed was installed adjacent to No. 2 machine room and the road bed lowered to a point where pulp could be loaded from the same level as the warehouse storage shed. This was a particular problem at Brunswick because tides often cover an area as low as the track bed. This problem was overcome by diking around the tracks on the end with the lowest elevation and putting in a flood gate which would let drainage water out but would keep flood tides out. This has worked very satisfactorily and increased the efficiency of shipping facilities immeasurably.

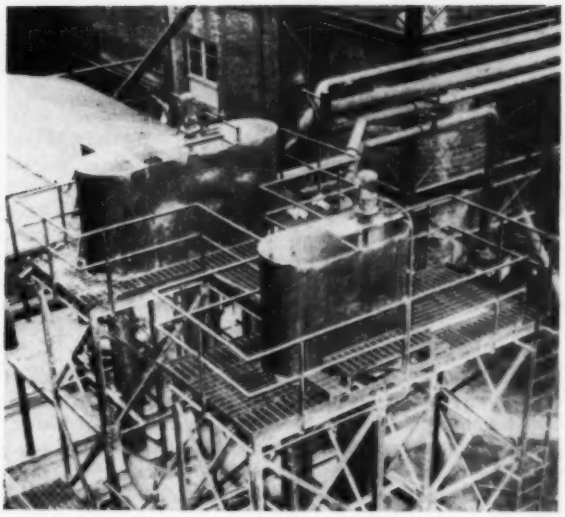
Services

In order to produce this added pulp, additional electrical and steam generating capacity was required. A new 6250 KVA, 5000 KW, .8 power factor unit, 4160 volt, 3600 rpm, 400 psig initial pressure covering generator was installed with 150 and 35 lb. extraction with condenser capable of taking full generator capacity. This new turbine was installed and on the line in April, 1951, just nine months after the decision to proceed with the job. A new 120,000# B&W oil fired boiler designed for 450 psig, 725° t.t. operation with auxiliaries was installed. This allows steam to be generated from oil to be generated in an efficient oil fired boiler, whereas previous operation had required that bark and oil be burned together. The old combination oil fired bark burners are being remodeled with Hofft over fired air jets, redesigned grates and Thermix dust collectors installed ahead of the I. D. fan to put them in efficient operating condition for bark burning only. Under the new setup, the total steam load can be carried with any one of the bark burners or the new oil fired boiler off the line for repairs. The plant has never previously been in this position, and untold flexibility should result from the ability to pull any steam generating unit off the line while maintaining full production.

In order to provide a uniform sized bark for conveying and burning, an experimental Blo-Hog unit has been installed to hog all bark and refuse prior to conveying to the modernized bark



First stage chlorination washer, manufactured by IMPCO, that was installed in the bleach plant



Desired consistency is obtained by use of a DeZurik consistency regulator

burners. Consideration is being given to the installation of a screen ahead of the hog in order to reduce the material passing through the hog to only that size material actually requiring hogging.

Electrical distribution

The primary electrical distribution system was changed over from 2300 volts to 4160 volts. General Electric metal enclosed switchgear was installed, all units being in line and fed from a 2000 ampere main bus. Each unit is equipped with air circuit breakers rated 1200 ampere and 250,000 KVA interrupting capacity. All outgoing feeders are equipped with Kilovav, Kilowatt, ampere and integrating watt-hour meters. Each generator panel has Kilowatt; Kilovav; ampere and integrating watt-hour meters. Field volt and ampere meters along with necessary field application relays and control switches are also provided. Each machine has its own exciter and voltage regulator and a spare exciter along with its voltage regulator can be paralleled with and substituted for either of the three regular exciters.

The No. 1 Turbo-Generator-Turbine rating 4000 KW, double extracting partial condensing-Generator rating 5000 KVA, .8 P. F., 2300 volts was rewound for 4160 volts. The No. Turbo-Generator-Turbine rating 2000 KW, single extracting back pressure-Generator rating 2500 KVA, .8 P. F., 2300 volts was also rewound for 4160 volts.

In addition, the General Electric Turbo-Generator previously mentioned was installed.

All circuits of main distribution system terminate in departmental substations, 1000 KVA, 4160/480 volts, two at 1500 KVA, and type C low voltage control centers furnished by Westinghouse Electric Corp. The control rooms are well ventilated with filtered air to minimize the maintenance of controls to assure continuity of operations.

Motors installed are mostly General Electric totally-enclosed fan cooled and are started directly across the line. Motors 200 h.p. and smaller operate on 440 volts, 3 phase, 60 cycles, with a few single phase motors operating on 110 volts, 60 cycles. Motors above 200 h.p. operate on 4160 volts, 3 phase, 60 cycle power.

Liquor cycle

Evaporators—Since the 1948 program, Brunswick had evaporator capacity slightly in excess of its requirements under normal black liquor washing facilities. However, as the black liquor washing facilities were inadequate, solids delivered to the evaporator ranged as low as 12 or 13 per cent and as can be seen the evaporators were operating at capacity so far as water evaporation was concerned. By the installation of the new Oliver washers in the wash room, the solids delivered to the evaporators were increased to the point where additional evaporator capacity was not deemed necessary.

Recoveries—Prior to the expansion program, Brunswick had one 150 ton B&W recovery unit, one 75 ton B&W recovery unit, and one 220 ton Combustion Engineering recovery unit, the latter being installed in 1947.

During World War II, the No. 1 and 2 recovery units had been operating far in excess of capacity and were never fully repaired since that date. It was, therefore, deemed necessary to fully modernize the existing No. 1 recovery unit, and this was done by installing screen tubes over the furnace bed, the addition of an economizer, air heater, superheater tubes and a disc evaporator. A chemical ash tank was also installed to recover the ash, thus putting the unit in a completely modernized state. This resulted in a designed capacity for burning black liquor solids of 1,290,000 lbs. per day as compared with an estimated requirement at 400 daily tons of 1,200,000 lbs. per day.

Electrically, the recoveries and evaporators are fed from two 1000 KVA unit substations, type "C" low voltage control centers located in filtered air control room.

Water supply

In order to provide water requirements for the new addition, it was necessary to install a fifth deep well. This was put down by Layne-Atlantic Co., to a depth of approximately 1000 ft. and produces water at the rate of 3750 gpm. The over-all water requirements for the Brunswick mill range somewhere between 65,000 and 70,000 gallons per daily ton.

A new pump house was constructed in which is located six pumps, three handling approximately 10,000 gpm of treated water and three handling approximately 9,000 gpm of untreated water. Electrical controls are housed in a section of the same building. A new distribution header system was also installed. This means that water is always available at the pumped rate and no one take off can completely run out of water. The new piping is entirely above ground, eliminating much trouble from a maintenance standpoint. The water level at Brunswick is only two feet below ground and pipe corrodes rapidly when placed below ground in the salt water.

Ammonia Pulping Report

SINCE 1945, when Rayonier Inc. converted its Shelton, Wash. sulphite pulp mill to ammonia base pulping, interest in this process has grown. Hampered at times by shortages of ammonia, the process has taken hold and a number of mills have converted to the process and experimental runs have been made in other mills.

The original conversion was made to prevent pollution by the waste sulphite liquor and this is still one of the important reasons. Waste liquor from ammonia cooking at Rayonier is incinerated without heat or chemical recovery. Since the ammonia base is soluble compared to the insoluble calcium base liquor, it can be evaporated and burned without the scale-forming difficulties encountered with calcium base liquor, even though corrosion presents some difficulty. While a good deal of work has gone into development of a suitable evaporator and heat recovery furnace for ammonia base waste liquor, conclusive results have not yet been developed. Nevertheless the process has inherent qualities that make it attractive to sulphite mills.

An important attribute of the process is that the change-over from calcium-base to ammonia-base process is relatively simple with little modification of existing equipment and mainly requiring an installation for handling the ammonia. Even the old digester linings can be replaced as necessary in a more or less normally developed replacement program. The ammonia base liquor is exceedingly corrosive on the conventional calcium base digester linings, and this, of course, must be taken into consideration.

Details of the process, its advantages and limitations, are outlined in the following report by T. E. Detcher and R. M. Jones, Barrett Division, Allied Chemical & Dye Corp. Barrett (together with its affiliate, The Solvay Process Division) has been the main spark plug in back of the ammonia process development. An important ammonia producer, Barrett started a development program in the early 1940's and has been involved in practically all of the trial runs and mill conversions to the ammonia process.

Neither Rayonier Inc. (whose Shelton, Wash. mill started using the ammonia process in 1945) nor Eastern Corp. (which adopted ammonia pulping at its South Brewer, Me. mill in 1947 and its Lincoln, Me. mill in 1948) have developed information regarding their operations. Now, however, other mills that have entered this field have permitted mill visits and have generally disclosed information regarding operation.

Crown Zellerbach Corp., Lebanon, Ore.—This was the first mill to publicize the details of their ammonia pulping opera-

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For sulphite pulp manufacture . . .

The future and application of ammonium bisulphite pulping

T. E. Detcher

R. M. Jones

T. E. DETCHER and R. M. JONES
Barrett Div., Allied Chemical & Dye Corp.

AMMONIA BASE PULPING is an acid sulphite process wherein the active pulping chemicals comprise a solution of ammonium bisulphite in the presence of an excess of sulphurous acid. Compared with calcium base, the process is identical chemically except for the substitution of the ammonium for the calcium ion in the bisulphite.

Adapted from a paper presented before the Northwest Div., American Pulp & Paper Mill Superintendents Association, Minneapolis, May 4 and 5, 1951.

Development of the process

The first literature reference to the process is a German patent issued to Braun in 1902. The use of ammonia in combination with sulphurous acid was investigated in connection with acid, neutral and alkaline cooking. Until the Cross-Englestad patents (DRP 495, 146 [1930]; US 1,878,828 [1932]) of the 1930's and the use of the process in the Toten Cellulose Fabrik in Norway, little consideration was given to the industrial possibilities.

In early 1941, the Barrett Division, Allied Chemical & Dye Corp., became interested in the development of this process. In 1944, a research program was instituted in co-operation with an affiliate, the Solvay Process Division.

Encouraged by the results of this investigation, and with the industrial ammonia supply situation bolstered by the tremendous wartime expansion in ammonia production facilities, Barrett increased its efforts to publicize and develop the process for pulp manufacture.

A trial run was arranged with Eastern Corp., which resulted in the permanent adoption of ammonia base pulping for its South Brewer, Me., mill in the spring of 1946. The installation at its Lincoln, Me., division followed about a year and a half later.

On the West Coast, the Shelton, Wash., mill of Rayonier, Inc., was converted to ammonia base in 1945. In December of 1949, Crown-Zellerbach Corp. put their Lebanon, Ore., division on ammonia base. In co-operation with the Soundview Pulp Co., they planned to use this mill as a pilot plant for waste liquor disposal.

The first full-scale ammonia base acid sulphite operation in the Middle West started in the late fall of 1950, when Wausau Paper Mills, Brokaw, Wis., converted to ammonia base after a short trial operation.

More recently, Consolidated Water Power & Paper Co. has converted its Wisconsin Rapids mill to this process, and a number of other plants throughout the country have trial operations

tions and, in conjunction with Soundview Pulp Co., carried on the mill scale experiments. (Now that Soundview has become affiliated with Scott Paper Co., it is understood that this cooperative arrangement has been dropped.) A paper was given at the 1951 National TAPPI meeting by L. A. LaFond and W. F. Holzer, who outlined in detail the operations and results of the work at Lebanon which converted to ammonia base late in 1949. This work was summarized in a paper by R. D. Waddell at the 1951 Annual Meeting of the American Pulp & Paper Mill Superintendents Association and is given in the following pages.

Plans are under way at Lebanon to construct a half million dollar waste liquor disposal plant based on pilot plant studies of liquor evaporation and burning.

Wausau Paper Mills, Brokaw, Wis.—This was the first mill in the Midwest to convert full scale to the ammonia base acid sulphite system. After several months of laboratory studies, the change-over was made in November 1950. Main reason for going to the ammonia process was to try to find ways to alleviate the stream pollution problems. Experimental work spearheaded by Wausau and carried on cooperatively by Wisconsin sulphate mills indicates that satisfactory methods of evaporating and burning the waste ammonia sulphite liquor will be developed.

Major conversion problem was to build facilities to store and handle ammonia. Since the Barker system of acid-making is employed, substitution of ammonia for milk-of-lime presented few problems. Cooking operations are carried out in practically the same manner as for calcium base cooking liquor. In general, the operations are similar to those of Lebanon, except that there are differences because of the different grades of paper made at the two mills.

Consolidated Water Power & Paper Co., Wisconsin Rapids, Wis., started mill scale trials of ammonia pulping in the summer of 1951 to determine its value to the particular operations for this mill. While some of the other mills might benefit from increased pulp production to meet the requirements of their paper machines, as well as to alleviate stream pollution problems, the Consolidated mill is of adequate pulp capacity and must compute its savings on a different basis. As far as operations are concerned, they are reported to be satisfactory.

Marathon Corp., Rothschild, Wis., also carried on mill scale trials in the summer of 1951, and it is understood that the trials were successful from the standpoint of pulp and paper mill operations. However, Marathon has a distinct character in that it utilizes the waste sulphite liquor in making vanillin by the Howard process. This would certainly have to be evaluated in any consideration of the ammonia process.

Diamond Match Co., Ogdensburg, N. Y., will begin a 30-day trial on ammonia in early spring. Of interest will be the inclusion of full mill operation on New England hardwoods.

A number of other mills have experimented or are experimenting with the ammonia base acid system for sulphate pulping. It has already been used to produce pulps for a variety of purposes, including dissolving pulp and a number of different paper grades.

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or permanent conversions under active consideration.

The growing interest in this process, coupled with its industrial use in several installations, justifies a detailed description of the mechanism of the process and the technology of its use.

Raw materials

Ammonia, whose chemical symbol is NH_3, exists under atmospheric pressure and temperature as a gas but is compressed and cooled to form liquefied anhydrous ammonia.

A pulp mill using ammonia is normally supplied with liquid anhydrous ammonia in tank cars. Because of equipment considerations, substantially all installations unload anhydrous ammonia into water to form an easily stored solution of aqua ammonia, containing usually about 30 per cent by weight of NH_3. This aqua ammonia is handled to process in simple equipment and at minimum cost for storage and handling facilities.

Equipment considerations

Most mills converting to ammonia base pulping use existing acid making systems insofar as practicable. A milk of lime system in good condition can usually be converted directly, with little alteration except to provide for addition of the aqua ammonia in place of the lime slurry. The Jenssen limestone system can be readily converted by replacing the limestone with efficient inert packing material and providing for aqua ammonia supply. In either case, the acid towers can be expected to show increase in capacity due to the increased reaction rate of ammonia, as compared to the calcium or magnesium bases. In addition, the slightly higher solubility of SO_2 in ammonium bisulphite solutions permits increased acid strengths at comparable equilibrium conditions.

In the digester house, the same basic equipment such as instruments, piping, pumps, etc., as used with calcium base can normally be used with ammonia base.

Linings must be given special consideration. Practically any calcium base lining will last for some time after a conversion to ammonia base. A program of replacement should be set up to reline individual digesters with suitable materials as the need arises. Lining life to be anticipated will average from six months to one and one-half years. Length of time that any calcium base lining will hold up depends on its general condition, its length of past service and the characteristics of the original lining materials. Linings in accumulators, storage tanks and absorption towers, if in reasonably good condition, can usually be expected to run their normal life after conversion to ammonia base. Replacement with soluble base linings would be in order when normal relining time is reached. Soluble base lining, with furfural resin joint material replacing the common litharge-glycerine joint, is also finding application in systems still using calcium base cooking.

Corrosion

As to the corrosive properties of the ammonia base acid, it has been found desirable to replace bronze with alloy steel in such equipment as acid pumps; steam nozzles; tower, tank and digester fittings; strainers, etc. Bronze will not usually fail immediately unless in very poor condition, but its life is definitely reduced from that in comparable calcium base service.

Experience to date with the grades of stainless steels used in most mills indicates that stainless piping, valves or fittings in sound condition will give satisfactory service with the ammonia base acid and will run their present normal life. In systems where pitting is extensive and lime deposits fill the pits and prevent complete failure, serious leakage may occur when the ammonia base acid cuts these deposits loose. Both calcium (mono) sulphite and calcium sulphate are rapidly dislodged after short contact with this acid.

This property of scale deposit removal is one of the advantages of the process. Towers, tanks, piping, strainers, circulation systems, heaters, and blow pit drainer bottoms are free of troublesome scale, with resulting improved operation in all portions of the plant and concurrent reduction in maintenance costs for scale removal.

Acid Making

Sulphite mill operation on ammonia base is substantially simplified as compared to that on the other bases, whether

using either limestone or milk of lime.

Unloading of the anhydrous ammonia tank cars to produce the aqua ammonia is a simple procedure, and in most cases can be handled by the acid maker. Elimination of handling of limestone or lime, and operation of the lime slaking plant, and substitution of aqua ammonia piped to the acid system generally reduces the total acid plant labor demand.

Ammonia-base acid systems operate best where flow metering and indication are provided on both ammonia and water supply lines. Employing the usual method of controlling SO_2 burner gas production and concentration, proper proportioning of the ammonia and water results in a completely flexible control and uniformity of raw acid manufacture, within the limits of the chemical equilibrium of the operating conditions. Common difficulties of hot weather acid making are minimized, and it is sometimes possible to maintain year-round uniform raw acid strength conditions.

Operation of the overgas recovery system is not substantially different except as influenced by changes in relief cycles resulting from modified cooking schedules.

Digester operation

Changes in pulping are due substantially to two properties of the ammonium ion that are not true of the calcium ion, namely: (1) the rate of diffusion of the ammonium ion throughout the mass of the wood chip is apparently much higher than is that of the calcium ion, and (2) the ammonium salts of the many acids found in the digester during the cooking process are highly soluble, which is not the case with the calcium salts of these acids.

This high rate of diffusion and the absence of insoluble compounds permit complete and rapid penetration of the chip by the cooking chemicals and uniform progress of the pulping reaction throughout the wood mass in the digester. The only substantial lack of uniformity that can remain, except in the wood itself, is in the distribution of acid and heat and in the mechanical arrangement and density of the chip mass. These are dependent on the purely physical factors of circulation, steam admission, and chip distribution.

In commercial ammonia pulping practice, digesters have been brought up to 110C (on spruce) in half the normal time used on calcium base. Shortening of the penetration period, or time to reaction temperature, reduces the over-all cooking time with ammonia base.

Once penetration is completed and reaction temperature is reached, there is little reason chemically why the temperature cannot be raised rapidly to maximum, thereby saving time due to rapid reaction at high temperatures.

There is a tendency for cooking to proceed at a higher rate for a given temperature, and maximum temperature can usually be reduced. A balance must be struck between the advantages of reduction of time and lower temperature.

Two factors indicate that the reaction rate is more uniform with ammonia than with the calcium base. The first is that the relief comes off more uniformly. Quantity of SO_2 expelled is a function of the pressure . . . temperature equilibria, and the rate of release of inert gases depends on the rate of their formation in the pulping reaction. Leveling out of the over-all gas flow is probably associated with more uniform chemical reaction.

The second is that the color of the digester cooking liquor becomes darker much earlier in the cook than with calcium base and appears to develop at an even rate throughout the progress of the cook.

Endpoints will usually be somewhat different for equivalent bleachabilities, with darker endpoint liquor color and lower total SO_2 blow tests than in calcium base pulping. In general, conditions tend to vary less from blow to blow, permitting better control of all phases of the operation. In one mill, for instance, it was noted that digesters were blown with less average variation from the bleachability standard than had been the experience on calcium base.

Ammonia base vs. calcium base pulping

Ammonia and calcium base pulping is compared under a hypothetical set of mill conditions based on a composite of several operations. Because of the wide variation in pulping conditions on calcium base, these figures will certainly not duplicate or even approach the conditions in many mills, but almost any sulphite mill will be able to find some of their conditions represented here.

Let us select as this composite mill one which produces 160 A.D. tons per day of bleached sulphite pulp. The operation is integrated with its own paper machines and produces a variety of printing grades, bonds, and some market pulp which finds its way into many grades. There are four digesters equipped with forced circulation but direct steamed. Hot acid is used, and wood supply is spruce. Knotter screen equipment is relatively new and adequate for the tonnage produced, but no excess capacity is present. Flat screens are used for fine screening and are loaded to capacity at existing tonnage rates and per cent screen rejects.

Bleaching is three-stage chlorine-caustic-high density hypochlorite in a moderately old batch system. Pulp is cooked to an average permanganate of 10.0 and is bleached to a G-E brightness of 84-86. Capacity is just adequate, due primarily to overloading of washers.

The mill is converted to ammonia base, with the object of increasing production, reducing screenings losses and improving over-all yield, raising pulp quality, and precluding the necessity of adding extensive equipment to accomplish these changes. Wood costs are high and it is particularly desired to reduce wood consumption per ton. Present screenings are higher than optimum, due to acceleration of calcium base cooking schedules to maintain production. (See Table I.)

Total SO_2 was kept constant to minimize effect of higher total in cooking, although the better absorption and higher equilibria normally permit an increase in total SO_2. Combined SO_2 was cut, effecting a sulphur saving. This is possible with ammonia base because of the increased efficiency of the combined SO_2 and because it is unnecessary to maintain so large an excess of combined SO_2 as needed with calcium base to compensate for its poor penetration. Accumulator temperature was held constant, although better absorption equilibria will generally permit slightly increased temperatures if desired.

Precirculation time was kept the same on a temperature equalization basis, but this period became more effective in saturating the chips and starting the flow of cooking chemicals to the interior of the chip. The penetration time to reaction temperature 110C was cut from three to two hours. With further cuts in time to and at maximum temperature, a total cooking time reduction of one and one-fourth hours was effected. At the same time, the maximum temperature was reduced 6C.

Pulp of equivalent bleachability was produced in both cases. The time cut gave the required increase in production, and the temperature drop aided in effecting the yield increase, along with reducing steam costs per ton and providing additional pulp quality improvements. This balance between time and temperature reduction is not hard and fast. Where production increases are vital, the maximum temperature may be held constant and the pulp produced at desired bleachability in the shortest possible time. Another mill with ample digester capacity for the maximum tonnage might prefer to reduce the temperature and bleach consumption as far as possible. Wide flexibility in choice of conditions exists, and the best conditions should be selected individually for each mill. The influence of these changes will be readily evident to the operator, who will be able to estimate the over-all influence on production and costs. In Table II are given various pulp quality

Table I—Comparative Operating Conditions

	Calcium Base	*Ammonia Base*
Cooking Acid		
Per cent Total SO_2	6.00	6.00
Per cent Combined SO_2	1.20	0.90
Temperature—Degrees C	70	70
Cooking Conditions		
Precirculation—Minutes	15	15
Time to 110 Deg. C—Hours	3	2
Time to maximum temp.—Hours	6	5
Time at maximum temp.—Hours	1½	1¼
Maximum temp.—Degrees C	146	140
Maximum pressure—psig	80	80
Total cooking time—Hours	7½	6¼

Table II—Comparative Pulp Properties

	Calcium Base	*Ammonia Base*
Permanganate Number	10.0	10.0
Pulp Color, bleached—% G-E	85	85
Per cent screenings	2.9	1.2
Total yield—%	45.0	45.4
Screened yield—%	42.1	44.2
Cleanliness—visual	Shivy	Few Shives
Ash—%	0.500	0.290
Alc.-benz. soluble—%	0.70	0.50
Viscosity	—	Higher
Per cent fines—pass 150 mesh	—	Lower, 2-3%
Strength Characteristics (Ream 24 x 36—500)		
At 5 min. beating time:		
Burst—%	123	136
Tear-ratio	1.28	1.33
Tensile-kg.	6.9	7.4
Fold-M.I.T.-D.F.	608	825
Freeness—Can. Std.	675	680
At 35 min. beating time:		
Burst—%	173	177
Tear-ratio	1.07	1.10
Tensile-kg.	8.3	9.1
Fold	1765	3046
Freeness	328	330

values to be expected in ammonia and calcium base pulping under the respective pulping conditions given in Table I. It is to be noted that if the pulping conditions had been modified without changes to ammonia base, many of the quality factors would have been impaired.

Although our hypothetical mill did not attempt to reduce its bleach consumption, the permanganate number could have been lowered substantially with little effect on pulp quality. Reduction in bleach demand up to about 20 per cent can usually be made with minor influence on strength properties. Ammonia base pulping permits improved bleachability with less change in strength than with the other acid pulping bases.

There are a number of other gains in actual behavior of the pulp in the system. Favorable increases in drainage rates have been experienced. The pulp will normally screen and wash at a substantially higher rate, increasing the capacity of the equipment. Blow pit drainage also is capable of improvement, partially due to improved drainage rates of the pulp itself, plus the absence of flow-reducing scale in the drainer bottoms.

Wood utilization

Because they are difficult to pulp, woods such as jackpine, maple, beech and others are often not considered for sulphite pulping. However, the penetration rate and efficiency of ammonia base pulping make possible the utilization of these woods. Had we been using, for instance, a partial poplar furnish in a certain bond sheet in our hypothetical mill, we would expect to be able to increase the amount of this poplar and still be able to upgrade the sheet in many ways. In addition, other woods, both long and short fiber, could be pulped satisfactorily and added to the furnish in proportions to accomplish certain desired gains or changes adaptable to the economic situation and the quality requirements of a particular mill.

Maple and beech are being pulped commercially with ammonium bisulphite and are being successfully used in paper grades usually regarded as too high quality for pulps of this type. The use of poplar ammonia base pulps has been particularly successful in industrial application. Percentages have been increased and most favorable gains in strength and other properties reported.

Jackpine has been pulped commercially with calcium base, but the results were discouraging, especially if the percentage of heartwood was high. Temperatures had to be held so low that long cooking time was required. Screenings were high if reasonable cooking times were employed. Strength and color were not of the best. Some recent ammonia base trials on this wood, high in heart, were most encouraging. Moderate temperatures and practically applicable cooking time produced pulps of acceptable strength, cleanliness and color, and with screenings approaching the range of normal sulphite experience on the more commonly used coniferous woods.

Papermaking with ammonia base pulp

Commercial experience has shown improvements to paper mill operation and production, directly related to the conversion to the use of ammonia base pulp. Some changes in stock preparation practice and papermaking methods may be necessary, but most experience shows substantial benefits.

Economic considerations

The ammonium bisulphite process is attractive economically because it permits a considerable increase in pulp mill output. The capital outlay is small when compared to the expense of the additional digesters that would be required in many mills remaining on calcium base. Mills located in areas of high wood cost have the way opened to utilization of local species previously incapable of application, and of obtaining higher yields from practically all species used, whether imported or local.

Improvement of product quality standards is never a retrogressive step, even in a seller's market. Any gains along this line from the use of ammonia base pulp are long term gains and tend to solidify a mill's position in a competitive quality market.

Extension of sulphur supplies is a most important consideration. These important considerations must be weighed against the fact that the base costs of ammonia as against limestone or lime will be higher on a delivered-to-mill basis. This differential will average from $2.50 to $4.00 per pulp ton in most of the important U. S. pulp producing areas. However, there are few, if any, mills that would not at least break even on the process. The majority of the mills can expect to be definitely ahead on an over-all economic basis, as has been proved in practice.

Waste sulphite liquor disposal

Although the place ammonia base pulping in the over-all waste liquor disposal picture is a subject in itself, some recognition must be given at this time to the subject as it affects current trends.

The non-scaling properties of the ammonia base waste liquor are a distinct advantage over calcium, as no special equipment to overcome scale formation appears to be required. Critical viscosity-temperature relations of the ammonia base waste sulphite liquor are compensated for in forced circulation or falling film evaporator equipment.

From the standpoint of burning waste sulphite liquor as a primary or auxiliary fuel, calcium base has the disadvantage of introducing the problem of fly ash disposal. This question does not, of

course, arise with ammonia base, inasmuch as the only ash present will be that originally present in the wood and removed from the digester in the waste sulphite liquor. No noxious fumes, with the exception of SO_2, have been experienced to date, as the ammonia decomposes at boiler temperatures and the hydrogen therefrom is burned. The original heat of formation of the ammonia is liberated in this thermal decomposition and combustion.

If the SO_2 from the waste sulphite liquor is expelled from the recovery boiler stack on a 24-hour basis, an air pollution problem may well arise which will require its removal from the flue gases. This is also worth considering from an economic and sulphur supply point of view. To accomplish this in a calcium base mill will be difficult at best and can also be expected to be rather expensive. It appears from data presently available that equipment and operation costs will be at a minimum with ammonia base, where the ammonia supply to the acid system would be used to strip the SO_2 from the flue gases. The elimination of need to handle base material in slurry form in the absorption system, coupled with the rapid reactivity of the ammonia and SO_2, promise a greatly simplified and cheaper system.

Preliminary work on ammonia base waste sulphite liquor in yeast manufacture indicates that at least part of the nitrogen required to promote the growth of the yeast will be available in the waste liquor.

The value of dried ammonia base waste sulphite liquor as a fertilizer has been demonstrated in investigations pursued by the Barrett Division in cooperation with various agricultural agencies. The market is completely undeveloped and appears to be limited at present to a small portion of the total industry effluent. There are also technical problems involved in preparing the dried solids and putting them in suitable physical condition for use. The subject does, however, merit further investigation as a possible outlet for at least a portion of the waste sulphite liquor now being disposed of in other ways.

At present, ammonia is not recoverable for re-use from the waste sulphite liquor on an economically favorable basis. Lime distillation is possible with high recovery of ammonia, but the overall cost is unfavorable. Work has been done on the pressure pyroloysis of ammonia base waste sulphite liquor to recover part or all of the ammonia. A special furnace and auxiliary equipment are necessary. No commercially successful unit is available at present, and apparently much more investigation is in order.

As with all the other pulping bases, evaporation and burning of the ammonia base waste sulphite liquor appears at present to be the most generally applicable solution. The possibilities for success of ammonia in this field are well recognized, with one commercial installation having been in operation for some time in the U. S.

Ammonia base sulphite production

R. DOUGLAS WADDELL
Technical supervisor
Crown Zellerbach Corp., Lebanon Div.

AMMONIA BASE SULPHITE acid has successfully replaced dolomite base acid for cooking of western woods (both western hemlock and white fir) at the Crown Zellerbach plant located at Lebanon, Ore. The pulp produced from this process has been used successfully over the past two years for the manufacture of such specialty grades of paper as butcher, dynamite cartridge paper, salesbook, and several other grades of unbleached wrapping.

In converting from a dolomite (milk-of-lime) base to an ammonia base, it was necessary to eliminate all copper alloys from the system and to install equipment to convert anhydrous ammonia to a solution at 17 per cent concentration.

The acid plant is a vacuum-type Barker tower system with a strong and weak tower. In place of the milk-of-lime entering the top of the Barker tower, the 17 per cent ammonia solution is added with the required amount of water to reduce the concentration to about 3 per cent. The balance of the acid-making process is the same with an end product of ammonium bisulphite acid instead of calcium-magnesium bisulphite.

Experience revealed that, by lowering the combine in the cooking acid from 1.30 per cent SO_2 to 0.85-0.90 per cent, no harm to pulp occurred, except a lowering of color. This lowering of combine was done to reduce the cost of ammonia.

Cooking was found to be much more rapid because of better acid penetration of chips, resulting in the lowering of digester temperature by 20F at the same cooking rate, or 10F with an increase of 12 to 15 per cent pulp production. Screenings have been reduced by more than half, due to better penetration of the base; and the screenings operation speeded up by 25 per cent.

The pulp requires a little less beating, yet it is a freer pulp and behaves about the same on the paper machines as dolomite base pulp. The pulp bleaches normally and uses the same chlorine as dolomite pulp on the basis of bleachability. Pulp color is about 5 to 7 points low on a G.E. brightness tester, due to the lower acid combine. It is possible to produce a higher color by increasing the ammonia which will give a higher combine SO_2 in the cooking acid.

So far as paper machine operation is concerned, there has been little change in any section of the machine. It has been noted that the pulp hydrates quite easily; judgment must be used not to overbeat, so that the machine operator can use the jordan.

Paper quality is equal to or slightly better and seems to be more uniform than paper made from the dolomite pulp. There has been a slight increase in Mullen, an increase in tensile, no change in tear, and some improvement in size—both the sugar test and ink flotation for butcher grades. The color of pulp, of course, reflects lower color on paper—not a serious feature on unbleached grades.

One condition not anticipated, but readily understood when encountered, was a vigorous growth of slime in the pulp system from the knotter through the deckers. The nitrogen present in the slush stock at this point is an excellent nutrient for microorganisms. A second experience with slime was encountered in a lapped stock pile set aside for use when required. Both of these conditions were brought under control by use of organomercurial slimicides.

Summarized as follows: Ammonia base acid at the Lebanon mill has increased pulp mill capacity, improved pulp yield, improved operation, improved strength, and decreased maintenance. Against these advantages are increased chemical costs, an increase in slime trouble, and a darker color of unbleached pulp. The first disadvantage is offset by direct savings in operation; the second is readily controlled; and the third has not proven a deterrent in the grades manufactured. It is generally agreed that other mills could obtain similar results. Whether they would prove advantageous would necessarily be judged by each mill separately.

Adapted from a paper presented before the 32nd Annual Convention of the American Pulp and Paper Mill Superintendents Association, held at the Multnomah Hotel, Portland, Ore., June 24-28, 1951.

Safety films for the paper industry

Listed on this page are some of the more important safety films designed specifically for the pulp and paper industry. The information was gathered and compiled by Harold R. Alley, staff representative for the Pulp and Paper Section, National Safety Council, Chicago.

PULP AND PAPER FILMS

(Includes Manufacturing, Products, Logging, Printing, Advertising and Packaging)

TITLE	DISTRIBUTED BY	ADDRESS	TECHNICAL DATA*	SUBJECT MATTER
PACKAGING & ADVERTISING				
Pulling Power of Printing Bristol	Linton Brothers & Co.	22 Hollistone,Fitchburg,Mass.	1947-15min-sd-color-free loan	Advertising ideas
The Magic Box	Modern Talking Picture Service	45 Rockefeller Pl, N.Y. 20	1951-30min-sd-color-free loan	Development of packaging
Packaging	Bemis Packaging Service	Bemis Bros.Bag, Minn., Minn.	1950-40min-sd-color-free loan	Packaging materials &methods
PAPER MANUFACTURE				
From Tree to Newspaper	Enc. Britannica Films, Inc.	1150 Wilmette Ave.,Wilmette, Illinois	1948-15min-si-B&W-$24	Felling, pulp, newspaper
Gift of Ts'ai Lun--Paper	Hammermill Paper Co.	Erie 6, Pa.	1946-33min-sd-part color-f.loan	China, manufacture by machine
Magic Fiber	St.Coll.of Wash.,Audio-Visual	Pullman, Washington	1945-25min-sd-B&W-rent $1	Pulpmaking & logging
Making a Book	Enc. Britannica Films, Inc.	1150 Wilmette, Wilmette, Ill.	1951-15min-si-B&W-$24	Paper Mfr. & book making
Newsprint	Natl.Film Board of Canada	New York 20, N. Y.	21min-sd-color-free loan	Logging, Quebec, Mfr.
Pulp & Paper from Canada	Natl.Film Board of Canada	New York 20, N. Y.	1949-23min-sd-B&W-$60-free loan	Logging, Mfr., conservation
Paper Forests	Association Films, Inc.	347 Madison, New York 17,N.Y.	1948-11min-sd-B&W-$45-rent $2	Logging to paper mill
Paper Making	Coronet Films	Coronet Bldg.,Chicago 1	1941-20min-sd-B&W-$80	Logging, mfr., testing
Pine Ways to Profit	United World Films,Inc.,Gov't. Film Department	1445 Park Ave., New York 29	1935-20min-sd-B&W-$26.41	So.Forests,Conservation,mfr.
Short Course in Paper Making	F.H.Glatfelter Co.	Spring Grove, Pa.	35min-sd-color-free loan	Trees, Mfr., Printing
Spare That Tree	Princeton Film Center, Inc.	Carter Rd., Princeton, N.J.	1950-15min-sd-B&W-free loan	Hydrobarker
Story of the Hi-Density Feeder	Allis-Chalmers Mfg.Co.,Advertising and Industrial Press Dept.	Milwaukee 1, Wis.	12min-sd-color-free loan	Moving of pulp in mills
Trees to Tribunes	Chgo.Tribune,Public Service Off.	33 W. Madison, Chicago 11	1948-30min-sd-color-free loan	Timber to newspaper
World of Paper	Gen.Electric Co.,Dist.Section	1 River Road,Schenectady 5,NY	1925-29min-si-B&W-free loan	Early & modern mfr.
Paper	Enc. Britannica Films, Inc.	1150 Wilmette,Wilmette, Ill.	1946-11min-sd-B&W-$50,rent$2.50	Papermaking, educational
PRODUCTS				
The Danger Point	Association Films, Inc.	347 Madison, New York 17,NY	1943-12min-sd-color-free loan	Health by use of paper
Paper--Guardian of Health	Lily-Tulip Cup Corp.	122 E. 42nd St., New York 17	1945-35min-sd-B&W-free loan	Mfr.,Lily-Tulip products
Paperboard Packaging	Association Films, Inc.	347 Madison, New York 17,NY	1949-32min-sd-color-free loan	Mfr. of paperboard & cartons
Safe Service	Institute of Visual Training	40 E. 49th St., New York 17	1950-15min-sd-B&W-$25,free loan	Use of paper cups, etc.
LOGGING				
Case of the Barking Log	Allis-Chalmers Mfg. Co.	Milwaukee 1, Wis.	1946-10min-sd-color-free loan	Hydraulic barker in use
Monarchs of the Forest	International Harvester Co.,Inc.	180 N.Michigan, Chicago 1	1947-23min-sd-color-free loan	Int.Harv.equipment in No.W.
Western Logging,then and now	Caterpillar Tractor Co.	Peoria 8, Ill.	1948-19min-sd-color-free loan	Early & modern logging
Woodcutter's Dream	Princeton Film Center, Inc.	Carter Rd.,Princeton, N.J.	1950-20min-sd-color-free loan	H. Disston & Sons saws
Yarding Logs	Harig Motion Picture Co.	5514 University,Seattle 5	1950-23min-sd-color-purchase & rent,apply	Safety for loggers
PRINTING				
Rainbows to Order	International Printing Ink	67 W. 44th St., New York 18	1949-21min-sd-color-free loan	Mfr. of printing inks
Story of Printing	Enc. Britannica Films, Inc.	1150 Wilmette,Wilmette, Ill.	1950-40min-sd-B&W-$165-rent$10	History of printing
GENERAL				
River Run	U.S. Forest Service	Washington 25, D. C.	1951-15min-sd-color-free loan	Forest Mgt. & Driving
Watershed Fire	Civic Films	8923 Sunset,Hollywood,Calif.	1951-15min-sd-color-$137.50	General; Fire causes
Paper--Pacemaker of Progress	F. C. Huyck & Sons	Rensselaer, N.Y.	sd-color	Paper machine Felt Co.
Printing	Jr. Assn. of Commerce	New York, N. Y.	- - -	- - -

*SEQUENCE OF DATA - Date Released - Running time in minutes - Sound or Silent - Color or Black & White - Purchase Price and/or Rental Price.
ABBREVIATIONS - sd - sound; si - silent; B&W - black and white. (All films listed above are 16 m.m.)
PRICE DATA - When only the amount is given, this represents the purchase price. When the amount is preceded by the word rent, this is the charge for the use of the film for one day. The words free loan indicate that the film is loaned at no charge except transportation costs.

NOTE: The bulk of the above information was obtained from the 1951 Educational Film Guide (H. W. Wilson Co., 950 University Ave., New York 52, N. Y.). This 794 page book lists 8,251 16 m.m. motion pictures on a very wide variety of subjects. There are many additional films on industrial, lumbering and safety subjects.

PULP AND PAPER SLIDE FILMS

(Includes Manufacturing, Newspaper, Cups, Stamps and Printing)

TITLE	DISTRIBUTED BY	ADDRESS	TECHNICAL DATA*	SUBJECT MATTER
Paper for the Making	Society for Visual Education,Inc.	1345 W.Diversey, Chicago 14	54fr-si-Guide-$3	From trees to newspaper
The Newspaper	Stillfilm, Inc.	171 S.Los Robles,Pasadena 5	1949-44fr-si-with text $2	Forest to home,Chgo.Trib.
Paper Pays Off in the Hospital	Lily-Tulip Cup Corp.,Sls.Trng.	122 E. 42nd St.,New York 17	15min-sd-loan	Hospital market for paper
Hare's How	Lily-Tulip Cup Corp.,Sls.Trng.	122 E. 42nd St., New York 17	35 min-sd-loan	"How" of selling
In-Plant Feeding Pays Off with Paper	Lily-Tulip Cup Corp.,Sls.Trng.	122 E. 42nd St., New York 17	15 min-sd-loan	Feeding workers
Paktites Preferred	Lily-Tulip Cup Corp.,Sls.Trng.	122 E. 42nd St., New York 17	20 min-sd-loan	Use & sale of paktites
Streamline with the Lily Line	Lily-Tulip Cup Corp.,Sls.Trng.	122 E. 42nd St., New York 17	15 min-sd-loan	Cup uses and benefits
How We Get our Paper	Young America Films, Inc.	18 E. 41st St., New York 17	1950-40min-si with Guide $3.50	Story of paper industry
Stamps & How They are Made	Natl.Film Board of Canada	New York 20, N.Y.	1949-35fr-si with script $2.50	Mfr. of stamps
Writing and Printing	Curriculum Films, Inc.	41-17 Crescent,LongIslandCity	1950-27fr-si with Guide $3.95	Means of learning

*ABBREVIATIONS - fr - frames; sd - sound; si - silent.
ADDITIONAL DATA - All of the above are black and white. The term Guide is used to indicate a teacher's manual or study guide which has been made to accompany the filmstrip. For most filmstrips only a sales price is given. Filmstrips which can be obtained without charge but must be returned to the source are marked loan.

NOTE: The above information was obtained from the 1950 edition of "Filmstrip Guide" (H. W. Wilson Co., 950 University Ave., New York 52, N. Y.). This 268 page book lists 2,968 films strips on a wide variety of subjects. Many strips are available on forestry, lumber and safety topics.

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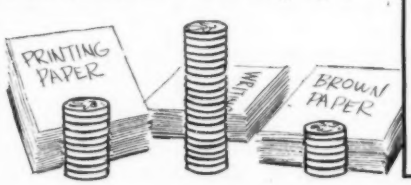

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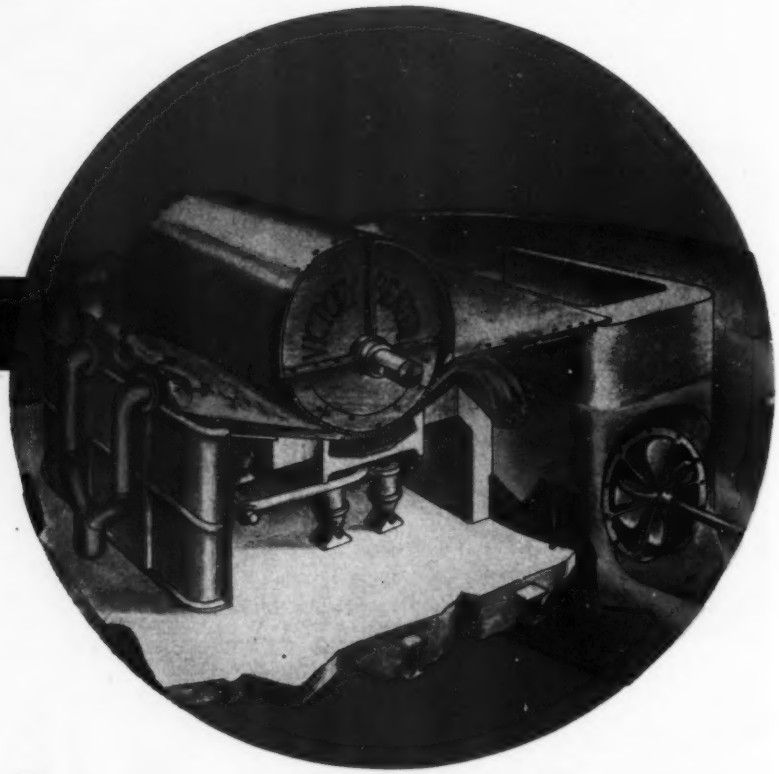

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MORE THAN 1,200 DELEGATES attend the Diamond Jubilee Dinner of APPA, which was held in the grand ballroom of the Waldorf-Astoria Hotel; view of the head tables shows the many industry leaders who were honored at the program; Sen. Harry F. Byrd of Virginia was the featured speaker

APPA holds 75th annual meeting

Optimism over the paper and pulp industry's present situation and its future, coupled with pessimism as to the effect on all industry of the current unparalleled demand for funds for the national government, was felt during the recent 75th anniversary convention of the American Paper & Pulp Association, staged at the Waldorf-Astoria Hotel, New York, N.Y., February 18-22.

Celebrating a year in which all production records were broken and tonnage spectacularly high, the convention demonstrated a spirit of looking toward the future. This spirit may be captured in highlights from addresses by the outstanding speakers appearing during the five-day program. Typical of the expressions by industry leaders are these by men whose names rank high in American business:

George Olmstead Jr., president of S. D. Warren Co. and retiring president of APPA: Only the federal tax bite spoiled a completely rosy hue—federal taxes having been so large that in spite of higher profit before taxes the net profit after taxes was a lower figure than that of 1951 in a good many industry units. Merchandising is the problem to which we must devote emphasis.

Cola G. Parker, president of Kimberly-Clark Corp.: When the government becomes the recipient of probably an over-all 60 per cent of the profits before taxes, the long-run effect is certain to be damaging to our production capacity. It will not show up in a year or two, for most of our machinery can be operated until, like the one-horse shay, it just falls apart. But it will happen in time unless we can retain enough of our income to permit us to adopt the improving technology so necessary to a dynamic economy.

D. C. Everest, president of Marathon Corp.: While some people may disagree because they do not have as many orders on hand at the moment for immediate shipment as they had at some time during 1951, I am still of the opinion that consumption of paper and paperboard during 1952 will run between 32 and 33 million tons, which will again be an all-time high.

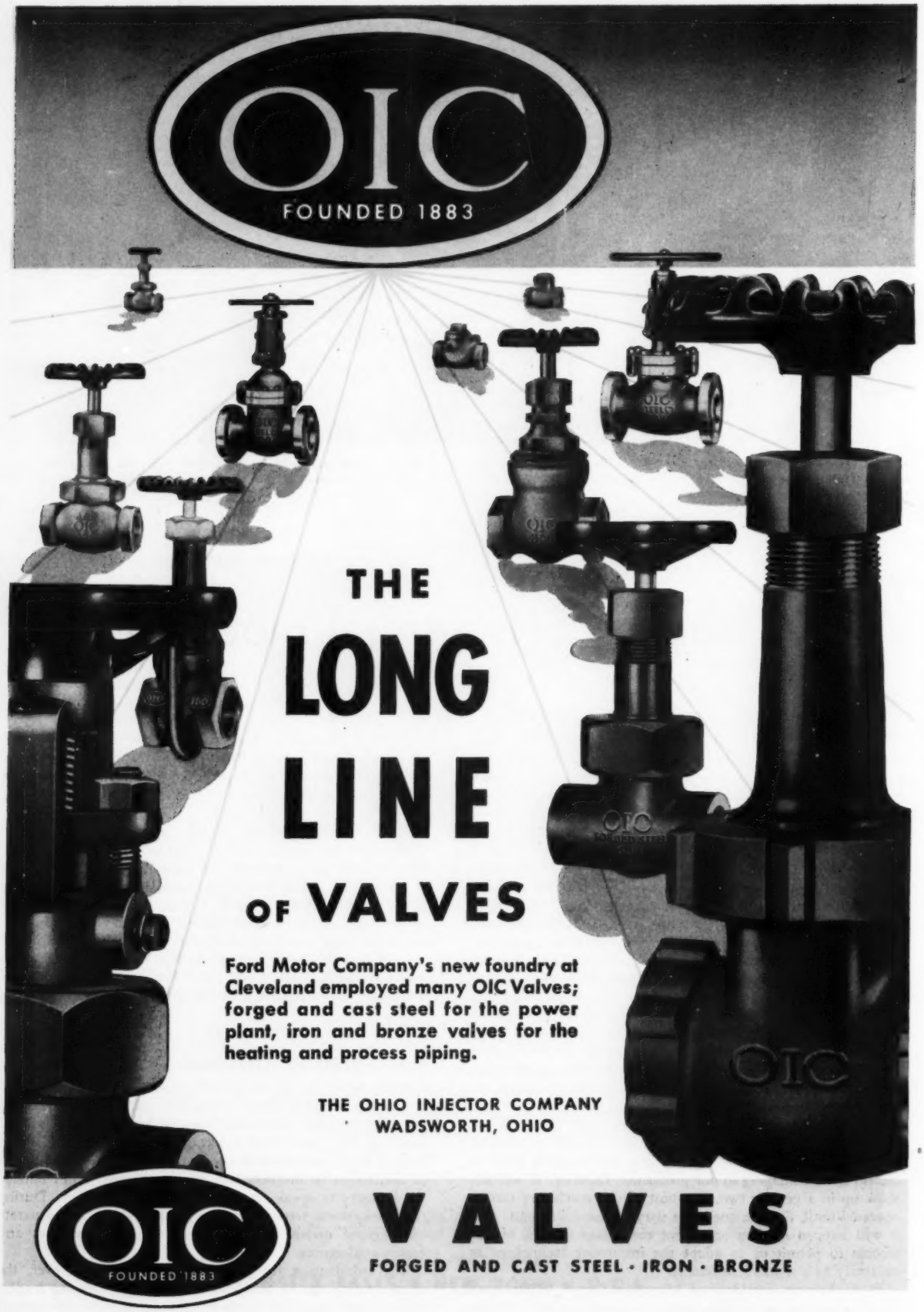
R. M. Fowler, president of the Canadian Pulp & Paper Association: In Canada there is a steady trend toward greater diversification of products in the paper field. In 1946, about 61 per cent of Canadian tonnage was newsprint, in 1951 only 56 per cent. A survey shows a total increase of newsprint capacity that could be undertaken if demand is great enough and if economic considerations justify of more than 1,750,000 tons, of which 914,000 tons are already underway.

Sen. Harry F. Byrd (Dem., Va.): President Truman has led the nation down the road of socialism by huge and unwise spending.

Record-breaking Attendance

The general picture of the convention was of a gathering of the leaders in the industry in numbers never before seen at a paper convention. Divisional associations held their annual meetings, and there was a trend among most of them of getting away from conferences for reviewing economic trends to invitations to business men and economists from outside the industry to speak on current national problems. During the week there were in the neighborhood of 100 separate meetings of divisional associations, special committees and group conferences.

The culminating feature of the week was, however, the open meeting on the final day at which the industry leaders quoted above were the speakers. The group meetings covered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every phase of the industry, from the pulpwood producers, through the pulp field, into the field of basic papers, and then into the further field of converted papers.

Among the divisional associations it was interesting to note that young men of the modern generation are more and more taking the places of their fathers. Among the elder statesmen, however, it was to be noted that the time-tried leaders are far from out of the picture. For instance, Sydney Ferguson, chairman of the board of Mead Corp., was chosen as the new APPA president.

Naturally, in view of the national defense program, questions arising from the pricing and production regulations of the Washington agencies were much to the fore. And nearly every group association included one speaker who discussed the peculiar problems within the field of that group. This was the more interesting because most of these speakers were not of the established Washington bureaucracy, but leaders from industry who have been loaned to the government to give their experience to the nation in properly solving the questions of allocations, pricing and the like.

It was significant to note that many of these speakers in the course of their remarks, not quotable for publication, referred frequently to the possibility of eventual decontrols, as the present emergency fades into history. The industry is naturally hoping for early decontrols, not to allow them to raise prices, but to let them operate in accordance with the law of supply and demand. The whole program of price ceilings, it was frequently shown, has not been a deterrent to mill operations, for in a surprising number of instances current prices are below the authorized ceilings.

The tone of the convention was surely one of optimism, only tempered by the fear of creeping paralysis through overburdening tax levies, and furtherance of socialistic schemes so dear to many Washington hearts.

Future Growth Keynotes Historic Diamond Jubilee Gathering

Celebrating the 75th anniversary of its founding, the American Paper and Pulp Association held its annual national convention February 18 through 22 at the Waldorf-Astoria Hotel, New York, N. Y. An unofficial tally showed that the 1952 gathering was by far the largest in the history of the organization.

Delegates attending the meetings heard noted speakers from both industry and government call for increased sustained-yield forestry practices to assure future growth, while experts in the fast-growing paper and pulp industry repeatedly asserted that in the years to come the field will see expansion considered impossible less than a decade ago.

APPA's 1952 meeting was in sharp contrast to the unheralded founding of the organization at Saratoga, N. Y., in 1877. This year there were scheduled more than 100 business sessions covering every conceivable aspect of the industry. Divisional group meetings staged by member associations attracted popular interest among the industry representatives taking part in the gathering.

Highlight of the five-day meeting was the election of Sydney Ferguson as president of APPA for 1952-53. Mr. Ferguson, chairman of the board of Mead Corp., succeeds George Olmstead Jr., who is president of S. D. Warren Co. Elevated to the position of first vice president was D. S. Leslie, first vice president of Hammermill Paper Co. E. W. Tinker continues as executive secretary-treasurer, a position he has held since 1940.

Sydney Ferguson, newly elected APPA president

Tinker Reviews Progress; Sees Steadily Growing Strength

". . . The time is very much here," Mr. Tinker declared in his annual report, "when the pulp and paper industry as a whole, without belligerence or brashness, should appear to take for granted its vital role in the United States economy, in the North American economy, with its splendid ally Canada, and in the world economy."

Addressing a meeting of the Sulphite Paper Manufacturers Association, Mr. Tinker stated that "from our own assumption of our constructive and beneficent economic power, those outside the industry particularly will receive an impression steadily growing in strength. I am sure we all see the evidences that this is indeed happening."

Reviewing the accomplishments of the past year, the speaker pointed out that, although the U. S. has but 6 per cent of the world's population, it now consumes 68 per cent of the world's production of paper and paperboard. Again, the U. S. leads in actual production, with 58 per cent of the global total—more than all the rest of the world combined. The next largest producer is Canada, with 9,600,000 tons in 1951.

Statistical Report

Mr. Tinker presented figures to demonstrate the tremendous impact of the pulp and paper industry on the U. S. economy. "In 1951," he said, "the pulp, paper and board industry employed 254,000 workers; allied products industries another 250,000; printing and publishing, entirely dependent on paper production, an additional 772,000. This creates a total of 1,276,000 people, which, you will note, yet does not include logging and other woods operatives. It is a conservative likelihood that more than 2,000,000 people in the U. S. are now engaged in pulp and paper work and directly related activities. An equally conservative estimate of their earnings is $7,500,000,000—an astronomical figure even in this era of astronomical governmental expenditures."

New production records in all major

George Olmstead, Jr., retiring APPA president

grades were set up in 1951, according to early estimates or complete figures. The over-all production of paper and board was 26,100,000 tons, a 7 per cent increase over the 24,300,000 tons of 1950; and the annual capacity on a six-day basis was more than 25,000,000 tons, a rise of 798,000 tons.

(Historical note: for the first time over-all annual production—inasmuch as many mills operated on a seven-day basis—exceeded annual capacity on a six-day basis. Much of this additional capacity came from mills already in so-called full operation as the year began.)

Continuing his annual report, Mr. Tinker declared that wood pulp production in 1951 reached a new high of 16,494,386 tons by preliminary estimates —an increase by 11 per cent over 1950. "However, while wood pulp production rose sharply," he continued, "there were in the supply of market wood pulp some noteworthy changes. The volume in market pulp remained approximately stationary, but there was a marked transfer from European to Canadian pulp, while at the same time domestic pulp production for the market rose 15 per cent. Shortages developed at many non-integrated mills, and at the year's close such shortages were still visible in bleached grades.

"From the figures indicating 1951 pulp consumption in over-all paper and board uses we observe that the increase in their production was predominantly in integrated mills. The rise in pulp consumption was 7 per cent—17,703,944 as compared with 1950's 16,496,981 tons."

Growth: Past and Future

Mr. Tinker briefly outlined the performances productionwise of various segments of the paper and board industry, which are summarized as follows: *Book and Groundwood Papers*—with a production of 3,518,000 tons, the previous year's record was exceeded by 215,000 tons; *Fine Papers*—production rose by 162,000 tons to 1,361,000 tons, an increase of more than 13 per cent over 1950; *Coarse Papers*—production of 3,588,000 tons was 9 per cent above the former record year of 1950; *Tissue Papers*—production of 1,482,000 tons was an increase of 8 per cent over the previous year's record; *Newsprint*—production of 1,107,000 tons was a 9 per cent increase over 1950; *Paperboard*—another record of 11,777,000 was chalked up, an increase of 6 per cent for the year, and *Building Papers and Building Boards*—production of 2,743,000 tons was an increase of 99,000 tons, or 3.8 per cent, for the year.

Surveying the planned future growth of the industry, Mr. Tinker revealed that the following increases in capacity, as determined by the latest APPA report, include practically all the certificates of necessity that have been granted to the present:

	Capacity Increases (in tons)	
	1952	1953
Paper Capacity	532,890	119,350
Paperboard Capacity	662,780	573,500
Wood Pulp Capacity	1,016,647	Unavailable

Olmstead Warns Industry to Watch Future Costs

Speaking before an open industry forum on the final day of the convention, George Olmstead Jr., retiring APPA president, declared that intelligent merchandising is the industry's biggest immediate problem. Such intelligent merchandising, he said, must have the attention of manufacturers over the coming 10 years.

Emphasizing the various ideas as to what constitutes a proper profit, Mr. Olmstead declared that, because of this discrepancy, a double standard of measurement is required—an individual mill shooting for one or the other of these standards, depending on its situation.

"In my opinion," he said, "this double standard—par on the course, if you want to call it that—is either 10 per cent on net sales or 15 per cent on capital investment in the business. I believe that all merchandising, all selling, should be directed towards one or the other of these profit yardsticks, particularly when you realize that we have not yet as an industry reached these goals. We have not yet made 'par on the course.'"

New pulp and paper mill construction, he continued, is so costly that marketing must be "extraordinarily intelligent" and must show a profit. "New construction for an integrated operation is being figured at close to $120,000 per daily ton of capacity. Much of the old and similar construction in the industry is on our books at around $35,000 per daily ton. The difference between these two, merely on depreciation charges figured at 4 per cent and carrying charges on the investment—likewise figured at 4 per cent, is approximately $20 per ton on finished paper, the old construction having the $20 per ton advantage from a cost-of-finished-paper point of view.

Taxes Spoil Picture

Mr. Olmstead, in reviewing 1951, declared that in all phases of the industry records were topped—in tons produced, dollar sales, employment, wages paid, profit before taxes. Only the federal tax bite spoiled a completely rosy hue, federal taxes having been so large that in spite of higher profit before taxes the net profit after taxes was a lower figure in a good many units of the industry than during the previous year.

Three major functions of APPA during this period of defense effort, the speaker said, have been to (1) guide the advancement of the industry's long-time program for sound growth; (2) to serve as a constructive and helpful watch dog on the production and pricing regulations instigated by government control agencies, and in that connection to spread information to all, to raise warning signals when a fire seems imminent, and to coordinate the fire fighters when it's required that we put out a blaze, and (3) to supply government control agencies with capable, well-informed men from our industry.

Accomplishments achieved by APPA during the past year have been many, according to Mr. Olmstead. Outstanding has been the growth in consumption. In 1939, he pointed out, this industry produced 13,500,000 tons of product, while the 1951 figure was almost double—to more than 26,000,000 tons. At the same time, consumption per capita has grown from 244 pounds in 1939 to just short of 400 pounds last year.

Reviewing technical progress, the speaker declared that over the past 15 years the pulp and paper industry has taken a leading position in research and technical development. "Our Institute of Paper Chemistry is the unparalleled model for similar institutions throughout the world. Our individual company research laboratories are improving each year—in knowledge, in character, and in output."

New Fields of Sales

Growth in the paper industry, Mr. Olmstead noted, has also been predicated on the discovery of new products and wholly new fields of sale. "In cellulose we have a basic material possessing the great advantage of relatively low cost," he continued. "Our industry has shown amazing ingenuity and pioneering courage in working out the substitution of a web of paper for other materials.

"The multi-wall sack, for example, is substituting for textile bags of all sorts and descriptions, and multi-wall sacks are now being used for packaging cement, fertilizer, chemicals, potatoes, fruits, and a constantly widening list of commodities and products that must be packaged for the consumer. It's a relatively new industry, it's a still rapidly growing industry, but since 1939 it has added over half a million tons to our growth.

"The paper container for milk has substituted for the glass bottle. . . . The

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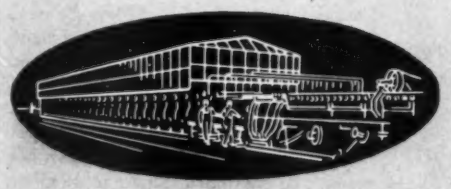

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carton has substituted for the wooden case, facial tissue has substituted for the handkerchief, wall board has substituted for wooden sheathing, and sanitary food containers of all sorts and descriptions have made possible the frozen food industry, the super market, and the pre-packaging of an infinite variety of foods. The cracker barrel is out for good, and it's the paper industry that put it out."

In addition, Mr. Olmstead continued, the APPA through its efforts has helped the industry fulfill its mission of increasing values. For that industry has improved the quality and usefulness of its products, while at the same time reducing the cost of their manufacture. Products are better today, better controlled, more uniform. Production per man hour has been steadily increased through mechanization. "As an industry," the speaker declared, "we have raised quality, we have reduced cost, we have increased value, and so we are measuring up to that great American yardstick of making more products for more people for less money."

Forest Conservation

Carrying through one of the major threads that characterized the entirety of the four-day convention, the speaker stressed the importance of modern forestry methods in the program of the APPA. "Another accomplishment to our credit," he declared, "is the fact that at long last we have accepted the responsibility for tree farming—the conservation and reforestation of our lands to a point where trees may be grown and harvested as a crop, thus preserving and expanding the supply of our basic raw material. Only stupidity and lack of trees can keep our industry from steady growth. Experience with my competitors leads me to doubt that stupidity is prevalent in our industry. There will be no lack of trees provided we have courage to maintain our interest and financial support in the educational and conservation measures connected with the tree farming concept."

Another accomplishment cited by Mr. Olmstead was in the field of labor relations, where the pulp and paper industry has one of the outstanding records in the nation, where individually and collectively members of the industry have done much to provide better livings for the men and women of the mills and for the communities in which they live.

Lastly, according to the speaker, APPA has led the way to financial respectability in the industry. In the years past the "investing public and banking fraternity" pigeonholed the industry as a feast-or-famine proposition, one whose equities had a somewhat sour smell except for the rankest speculator.

E. W. Tinker, who continues as APPA executive-secretary

R. M. Fowler, who talked on Canadian growth at the final APPA forum

Today, because of a 10-year continuity of profits and dividends and positive signs of sound leadership, the industry has grown to proper stature in the investment field.

"These accomplishments have matured our industry," the retiring president said in conclusion, "we are no longer just another industry getting along. Rather we are now the sixth largest industry in the economy, and we are being respected accordingly and are acting accordingly. . . . As a result we shall have continued healthy growth."

Olmstead Joined in Optimistic Outlook

Three men prominent in the industry found reason for decided optimism in their remarks made during the open forum, staged in the Starlight Roof of the Waldorf-Astoria. Joining Mr. Olmstead in an over-all summary of progress past and future, they spoke briefly of various phases of pulp and paper operations.

Fowler Cites Canadian Growth

Robert M. Fowler, president of the Canadian Pulp and Paper Association, told the group that the greatest industrial event taking place in Canada today is the development and expansion of the pulp and paper industry. "Pulp and paper remains first in employment in Canada," he declared, "first in total wages paid, first in export values and in total value of production, and first in capital invested."

"The total annual value of Canadian pulp and paper production exceeds the value of Canadian wheat and all other grains combined," he continued; "it is about equal to the value of Canada's total mineral production, including gold. Its exports amount to 24 per cent of all Canadian exports and provide about 35 per cent of all our exports to the United States."

Speaking of a survey made recently by his association, Mr. Fowler disclosed that total investment in the industry between 1950 and 1955 may well exceed $600,000,000. In dollar terms, this is a rate of investment 70 per cent greater than the growth of the industry between 1946 and 1950, and in volume terms about 35 per cent greater than in that postwar period. In round figures, the industry was capitalized at about $750,000,000 in 1945, and at more than $1,100,000,000 last year; and according to the CPPA survey, the figure will reach approximately $1,750,000,000.

Two essential points in a consideration of the present position and future prospects of the Canadian industry were cited by the speaker: (1) changes in the demand for paper products, and (2) ability to meet that demand. Concerning the former, Mr. Fowler declared that new and increased uses have become part of the standards of personal and industrial living on this continent, and that the old yardsticks of demand for pulp and paper production in North America are no longer relevant.

"For the ability to meet a rising demand," he continued, "the one essential is wood, and in this respect Canada is uniquely fortunate . . . Government foresters estimate a total productive forest area of 712,000 square miles, of which 484,000 square miles are accessible. Less than 75 per cent of the accessible areas are now occupied . . . In addition, there are great opportunities for increased yield on presently occupied areas, as losses from fire, insects and disease are reduced, and improved silviculture is introduce, and as we learn to use other wood species now largely wasted.

"The exact direction that the development of Canada's pulp and paper industry will take is anybody's guess. There is no government plan for the next few years and, of course, no industry plan . . . Apparently there is a steady trend towards greater diversification of products. We are no longer a preponderantly newsprint industry. All but one of the new mills built since the war have been for the manufacture of products other than newsprint.

"But the prospects for expansion in newsprint production are very large. Of a possible total expansion by 1960 of more than 1,750,000 tons, 914,000 tons of increased capacity are already underway, and these plans will go forward unless adverse economic conditions develop. One interesting figure that came out in the survey of possible newsprint expansion was the total of increased capacity that could result from further improvements in the efficiency of existing mills. Many of your politicians and perhaps some publishers seem to think that the limits of expansion of Canadian newsprint mills by machine speed-up and improvements have been reached. The survey has shown that it could go on at least until 1960 and could yield a total of 944,000 tons of extra capacity by this economic and efficient method of expansion. I think that this survey shows conclusively that if the United States and other countries throughout the world wish to use more newsprint, and if they choose and are able to buy it from Canada, they will in due course be able to obtain it."

C. G. Parker: Higher Taxes?

Notwithstanding the voices of experts who claim that the United States has reached the limit as far as concerns personal and corporate income taxes, there is probably a majority of people who still look upon industry as being fair game. This was the view expressed at the open forum by Cola G. Parker, president of Kimberly-Clark Corp.

Taxes at an ever-growing rate will soon have dangerous effect on the economy of the nation, Mr. Parker explained. "Under the present tax laws," he said, "the tax take this year will be $472 per capita, 122 times the rate per capita in 1900 and 12 times the rate per capita in 1940. And we are still faced with an estimated deficit of $15,000,000,000 . . . That of course isn't the whole picture. The other side of the escutcheon is that per capita income has only increased in 52 years less than eight times in dollars and much less than that in dollars of constant value."

Since a strong economy necessarily depends on a healthy, efficient and solvent industry, he continued, the present course of taxation undertaken by the federal government surely jeopardizes the future of the United States. Taxes on corporations today have passed the point where industry can prosper, and on the prosperity of industry depends the economic welfare of a nation. Corporate taxes are just as much an element of cost as raw materials or labor. They are usually included in the price of the output and are ultimately paid by the final consumer. This must be so because a corporation must make a profit if it is to survive; that must be profit after

Cola G. Parker, speaker at APPA's open forum

D. C. Everest, who discussed consumption at the APPA forum

taxes, and we all know that. Without profit an enterprise can neither get nor retain capital and must fall by the wayside.

Mr. Parker concluded his address by pointing up the action that should and could be taken by the government to assure that we remain free and economically strong: (1) Reduce non-defense spending; (2) require the return to sound money, balanced budgets, reduced fiscal exposure due to short-term floating debt and contingent liabilities based on debt guarantees; (3) announce intention to reduce taxes as soon as defense expenditures decline and avoid any temptation to adopt new spending programs; (4) drop controls on prices, consumption and investment at the earliest possible opportunity; (5) endeavor to secure labor support for programs for increased productivity instead of wage inflation, and (6) obtain assurance by industry that it will contribute its share of sound action.

Everest Sees Consumption Peak

Sounding an optimistic note for the future of the paper industry, D. C. Everest, president of Marathon Corp., predicted in the final address on the open forum program that paper consumption in the United States would hit an all-time high of between 32,000,000 and 33,000,000 tons during the current year.

"Since the end of 1945, the consumption of paper and paperboard has stepped up from 19,700,000 tons, when the national income was 183 billion dollars, to 31,900,000 tons in 1951, with a national income of 269 billion dollars, an increase in consumption in six years of almost 62 per cent," Mr. Everest declared. "Population increased from 140,000,000 to 154,000,000 or 10 per cent. If population increased only 10 per cent and the consumption of paper and paperboard increased almost 62 per cent, then a very large portion of this increased use was due to the development of new products and new uses.

"If the national income was 269 billion dollars in 1951 and is estimated at all kinds of levels from 300 billion dollars on up for 1952, where do people, both industry and government, expect to get their requirements? There are only so many working hours in a year, and these are rapidly decreasing due to more holidays and vacations. Although some people worry about the over-expansion of the industry, I doubt if we will have in actual operation new plants and facilities to meet the peak load of production required during the year. Nearly two months have already passed, and the production has lagged behind last year. We have 10 months in which to meet the demand occasioned by the increase in national income of a minimum of 30 billion dollars, and regardless of what this money is spent for, the paper industry will be required to furnish its products, as no one can do business without paper or paperboard.

"I have never known of a decrease in the use of newsprint and book papers during an election year. The hotter the campaign, the greater the use of paper, and this campaign will not be a 'cold war.'

Sen. Byrd Attacks Fair Deal at Jubilee Dinner

Calling for the defeat of the Fair Deal in the forthcoming presidential election, Sen. Harry F. Byrd (Dem., Va.) told those attending the Diamond Jubilee Dinner of APPA that only by such a defeat could the voters express their desire for a balanced budget and the end of mounting deficits.

More than 1,200 delegates attending the convention heard Sen. Byrd's address in the grand ballroom of the Waldorf-Astoria. A special feature of the dinner was the presentation of a huge 75-candle birthday cake, which was placed at the speakers' table. George Olmstead Jr., retiring president, presided.

Sen. Byrd, famed for his 19-year advocation of economy in the federal gov-

Sen. Harry F. Byrd, who addressed the APPA Diamond Jubilee Dinner

ernment, attacked the seemingly prevalent belief that "a little socialism is harmless." He said that this had been disproved in England, which has decided to "attempt the road back." He called for "recruits" in a fight against socialistic trends.

Terming the Fair Deal "ruinism," the Senator declared it was the real name for the welfare state, one of "twilight in which the glow of democratic freedoms is fading beyond the horizon." Although, he said, this country's free enterprise system presents the only real deterrent to Communist aggression, heavy government spending is cheapening the dollar. "Once the American dollar goes down," he continued, "we will enter an age of international darkness," in which the American system and freedoms of other nations will be destroyed.

Hammering at the present administration, Sen. Byrd declared that if President Truman is against socialism, why does he continue to pressurize Congress into adopting socialized medicine? Continuing, he asked that if the President is against socialism, why is he advocating the Brannan Plan, which inevitably means socialized agriculture? And if the President is opposed to socialism, why is he advocating another extension of socialized housing?

"In plain words," the Senator continued in his attack on almost limitless government spending, "in less than six and a half years, including only three months of World War II, Mr. Truman has taken from the people in the form of federal taxes $7,000,000,000 more than was paid into the federal treasury in the previous 156 years of our existence as a nation . . . And from the end of World War II, in six years under Mr. Truman, the federal expenditures totaled $260,000,000,000 or $81,000,000,000 more than in the entire life of our nation, excepting the three and a half years of World War II . . . In fiscal 1953 the Budget Bureau estimates the federal expenditures at 85 to 90 billions. If so, Mr. Truman will spend in one year—the year beginning July 1, 1952—more than one-half as much as all other presidents spent up to World War II.

"Democracy is approaching insolvency when: (1) We are unable to pay current costs of government over a prolonged period with taxes short of confiscation and diminishing returns, and (2) when the constant cheapening of the dollar is a result of these government operations.

"Without American solvency," the speaker concluded, "there would be no deterrent to Communism abroad. In the existing circumstances it is no exaggeration to say that there is literally nothing on earth more important than the preservation of the fiscal integrity of the federal government of the United States and of the economic freedom of the enterprise system."

Other 1952 Officers Named on Final Day

In addition to Mr. Ferguson and Mr. Leslie, who were named president and first vice president respectively, APPA's entire governing organization was announced at the business meeting which concluded the convention. New vice presidents and members of the executive board are Reuben Robertson Jr., president of Champion Paper & Fibre Co., and Hugo H. Hanson, president of W. C. Hamilton & Sons.

Vice presidents and members of the executive board who retain their positions through 1952 are as follows: M. D. Bardeen, president of Lee Paper Co.; Alexander Calder, president of Union Bag & Paper Corp.; Hugh J. Chisholm, president of Oxford Paper Co.; R. K. Ferguson, president and chairman of the board of St. Regis Paper Co.; J. H. Hinman, president of International Paper Co.; J. R. Kimberly, vice president of Kimberly-Clark Corp.; David L. Luke Jr., president of West Virginia Pulp & Paper Co.; R. A. McDonald, chairman of the executive committee of Crown Zellerbach Corp.; J. L. Madden, president of Hollingsworth & Whitney Co., and Vertrees Young, executive vice president of Gaylord Container Corp.

Shortage of Materials Highlighted at Session of APPA Materials Committee

"At best, authorized construction work for other than military and related purposes . . . will likely proceed during the second quarter at a reduced pace for lack of steel, with original completion dates far advanced." This was the view expressed February 21 by Merrill Russell, general attorney for United States Steel Corp., as he addressed an open meeting of the APPA materials committee, held at the Waldorf-Astoria.

Until the present Controlled Materials Plan is relaxed, he declared, improvement and expansion projects in the pulp and paper industry will have to be delayed. He explained that NPA had established three categories of essentiality in industrial equipment for the second quarter. The pulp and paper industry might have been placed in the second category, Mr. Russell explained, but even if it had rated the second category it would find output heavily curtailed.

However, Mr. Russell added that the outlook for the end of this year is brightening. According to experts, both steel and aluminum promise to be in more abundant supply.

Perry: 30 Million Tons by '55

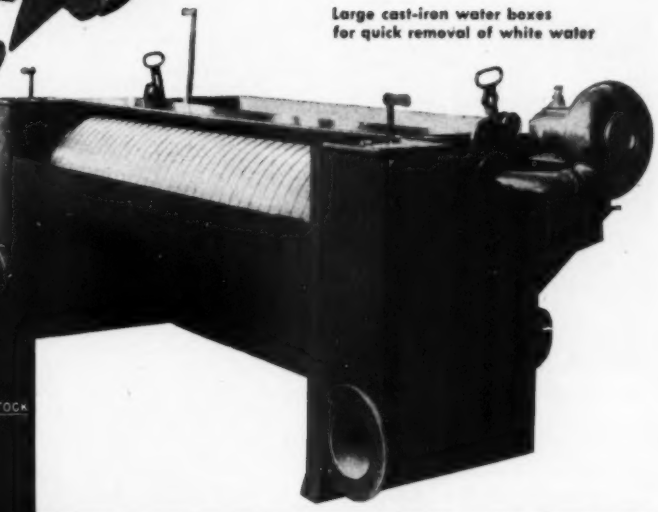
If currently projected expansion plans are completed between now and 1955, the industry will have a rated capacity of 30,000,000 tons per year, according to Henry J. Perry, editor of *Paper Trade Journal*. He emphasized that this capacity would be beneficial to the industry, as it will aid in the development of new business ot lasting benefit. In developing his theme that ample productive capacity and high consumption breeds more consumption, Mr. Perry advocated that more serious consideration be given to a definite development of the export market.

Also appearing on the program of the materials committee was Frank Mitchell, general manager of the Canadian Pulp and Paper Association. He reviewed the Canadian system of defense production steps that were taken to combat inflation within Canada, as well as to aid its curbing abroad. In addition, he reported in some detail on the methods of overcoming the current shortage of sulphur and the developments in Canada of native sulphur sources.

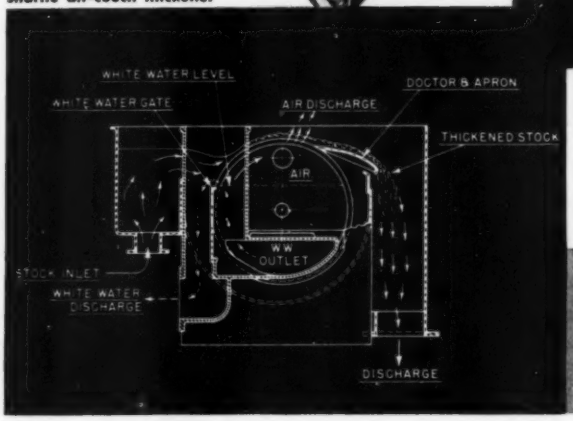
J. J. Forsythe, chairman of the TAPPI deinking committee and technical superintendent at International Paper Co.'s Niagara Falls mill, outlined the serious threat to the high grade wastepaper supply of resin, rubber, and plastic applications. These materials are costing the wastepaper consuming mills millions of dollars in lost time, waste materials, and consumer good will. There is a need for proper education to eliminate unusable papers from the regular packings so that this valuable source of fiber is not lost.

Note air-couch blowers at each end of mold

Large cast-iron water boxes for quick removal of white water



Stock and white water flow diagram Shartle air-couch thickener



something new in thickeners

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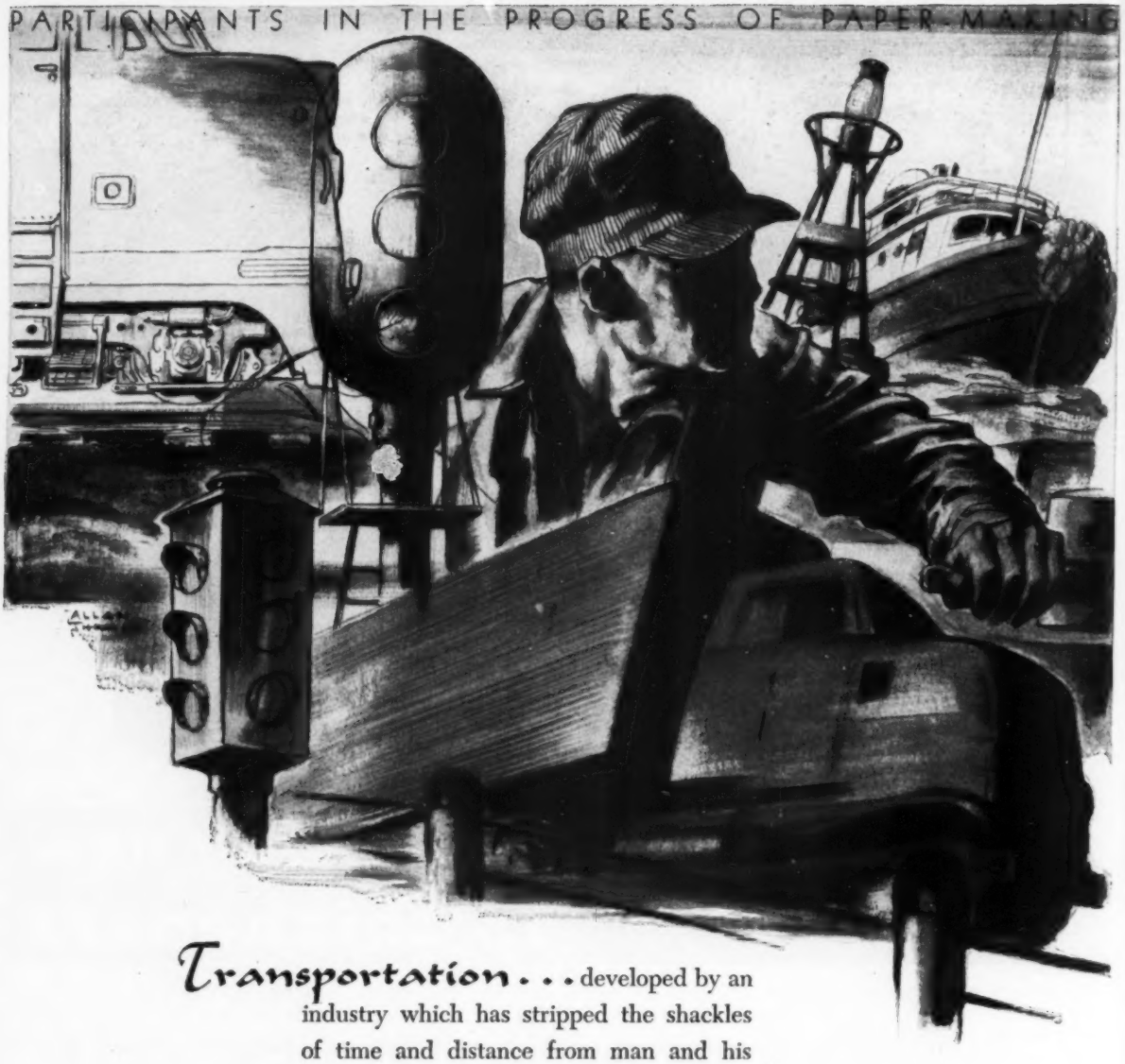

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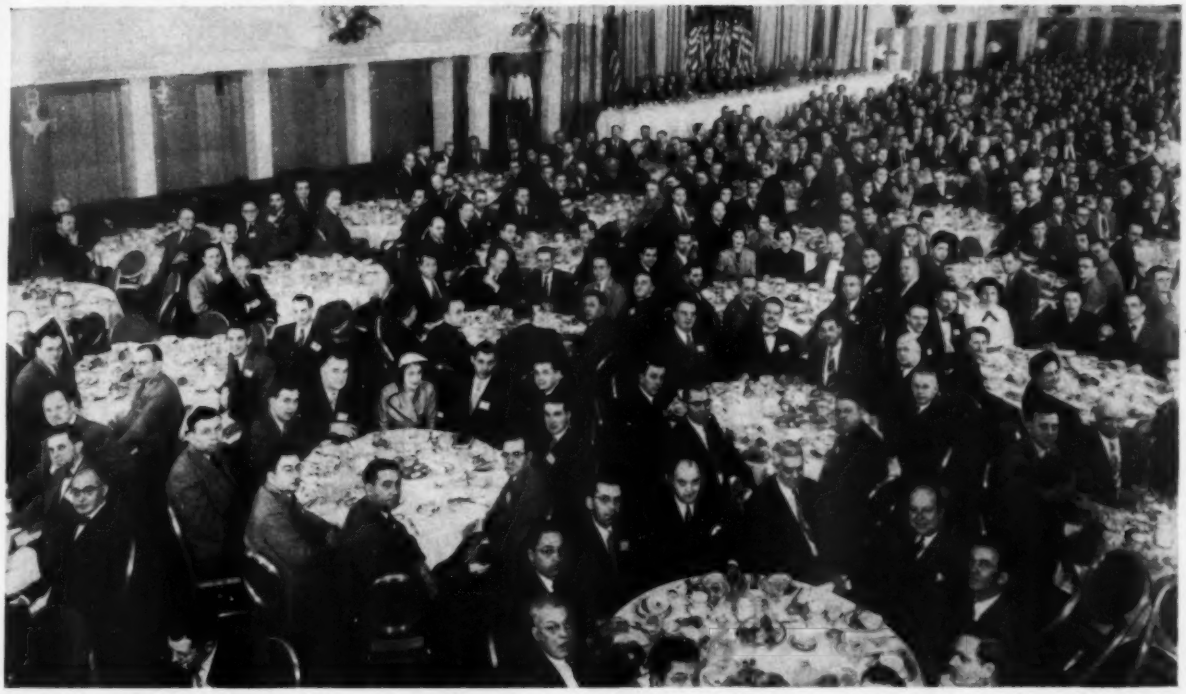

GATHERED TO DISCUSS TECHNICAL problems of the industry, members of national TAPPI stage their annual luncheon at the Commodore Hotel, New York, N. Y., which brought to a close the association's 37th yearly convention

Record Attendance at 38th Annual TAPPI Meeting

A. W. J. DYCK, Ph.D.
Consulting Editor

Record-breaking attendance of 1,800 members and a well-balanced selection of papers covering a wide range of problems in the pulp and paper industry marked the 38th annual meeting of the Technical Association of the Pulp and Paper Industry held at the Commodore Hotel, New York, N. Y., February 18-21.

Past contributions of the Technical Association to the pulp and paper industry are reflected in the 16,494,000 tons of wood pulp and the 26,100,000 tons of paper and paperboard produced in the United States in 1951. Improved methods of manufacture and a better understanding of the fundamentals underlying the science of pulp and paper making, as disclosed in the papers presented at these meetings, portend further spectacular increases and diversification of output in years to come. Production estimates for 1952 are 27,295,500 tons of paper and paperboard and 17,510,500 tons of wood pulp.

At the first general session the re-elections of K. P. Geohegan as president of the Association, and George H. Pringle as vice-president were announced. The election was also announced of the following four new members of the executive committee: Lewis K. Burnett, Ohio Boxboard Co.; James R. Lientz, Union Bag & Paper Corp.; George A. Day, Brown Co., and Harry F. Lewis, Institute of Paper Chemistry.

The general session was highlighted by the presidential address, which dealt with the contributions of the technician, engineer or scientist to the success of paper making, the complex nature of the technologies of modern paper manufacture, and the steps to be taken for TAPPI's future progress. R. G. Macdonald, secretary-treasurer of the Association, reported on the 421 gain in individual membership, which now stands at 4,689. He presented a summary of progress made in each of the various committee projects directed by the Association.

Other speakers at the general session were R. S. Preston, dean of the School of Forestry, Raleigh, N.C., who announced the pulp and paper course given by North Carolina State College, and F. H. Klaer, who reviewed the overall water supply situation in the pulp and paper regions and described means of utilizing available sources more efficiently by developing ground water supplies through induced filtration into Ranney horizontal collectors and wells.

The TAPPI Award was presented at the annual luncheon to Raymond S. Hatch for valuable technical contributions to the industry. Mr. Hatch is acting director of research at Hudson Pulp & Paper Corp., Palatka, Fla. Robert B. Wolf, consulting engineer of New Canaan, Conn., made the presentation. Walter J. Murphy, editor of the A.C.S. publications, spoke on scientific and technical manpower problems, deploring the present shortage of competent scientists and technologists and stressing the necessity of taking steps to utilize the available talent more efficiently.

Technical Sessions

Meetings of the numerous technical groups were held in morning and afternoon sessions during the four days of the convention. Attended by men from throughout this country and Canada, these discussions covered most of the current problems encountered in papermaking, revealing new methods as yet untried on a wide scale.

Acid Pulping

The topics under discussion at the meeting on acid pulping dealt with heat

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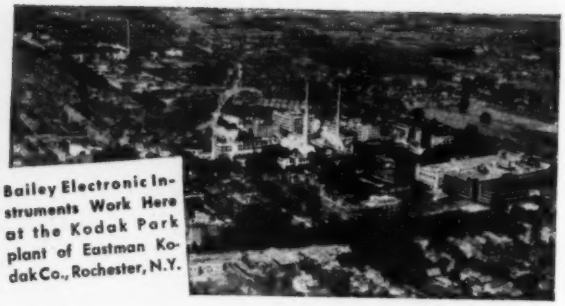

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and sulphur recovery from spent ammonia-base sulphite pulping liquor; the acid pulping committee report on the TAPPI strainer and circulation survey; sulphate formation and its effect on sulphur usage; magnesia-base recovery for the sulphite pulping industry, and modern developments in welded barking drum design. Chairman of the meeting was John M. McEwen, Weyerhaeuser Timber Co.

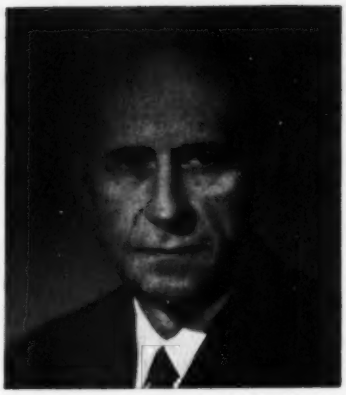
The practicability of a process permitting sulphur recovery from flue gases resulting from burning ammonia-base spent liquor was demonstrated by J. H. Hull, Crown Zellerbach Corp., and G. V. Palmrose, Soundview Div., Scott Paper Co. The process, operating on pilot plant scale, takes the liquor from a daily 10-ton pulp production, concentrates it on a Conkey flat heating surface from 9 per cent to 50 per cent solids, and burns it under a boiler. The flue gases were scrubbed with ammonia solution, and the resulting ammonium sulphite-bisulphite solution was added to the raw acid system. Recovery of useful sulphur varied from 100 to 125 pounds per ton of pulp.

The paper presented by George Knight and M. S. Anderson, Oxford Paper Co., showed the effect of dolomitic lime, sequestering agents, increased sulphur dioxide formation, and the elimination of external steam-injection devices on sulphate formation. Sulphur losses in the mill due to sulphate formation amounted to about 44 pounds per ton of bleached pulp, and approximately 80 per cent of the sulphate formation occurred in the digester.

Alkaline Pulping and Chemical Engineering

Held under the chairmanship of Henry Vranian of Chesapeake Corp. and J. R. Lientz of Union Bag & Paper Corp., this meeting's program comprised a wide range of subjects, such as: the effect of chip size in kraft pulping; high alpha cellulose pulps from scrub oak; barking of turkey oak; esterification of tall oil with glycerine; semichemical pulping, and sulphate turpentine recovery. A symposium on semichemical pulping focused attention on process flow sheets; corrosion problems; liquor preparation and recovery; strength-sheet density; diffuser washing, and process study.

W. J. Nolan and Wilson F. Brown, University of Florida, reported that chips which had been hammer-milled after pre-steaming yielded a pulp that was higher in fold and tear strength and equal in other factors when compared with pulps made from regular chips. Hammer-milling of dry chips prior to cooking seems a promising mill operation. Bulk density of the hammer-milled chips increases by 24 per cent, yields of



Ken P. Geohegan, reelected president of national TAPPI

R. G. Macdonald, secretary-treasurer of the Technical Association

screened pulp increase to 50 per cent from the conventional 43.4 per cent, and cooking time is reduced to 1.5 hours from the 2.5 hours required for regular chips. They presented further data on the Florida continuous oak pulping process, which involves pre-steaming and shredding of chips followed by pulping at controlled constant concentration and temperature. Yield, lignin, and alpha cellulose content can be closely controlled by steam pressure, liquor concentration and time.

A new method for barking oak was described by R. L. Harvin, Mr. Nolan and Mr. Brown. It consists in chipping the logs with bark attached, screening, and then separating the bark from the chips in air-flotation equipment. Drum barking of freshly-cut oak logs, it was pointed out, takes about twice as long as barking time for pine logs.

Robert S. Aries and Melvin Wolkstein, Polytechnical Institute of Brooklyn, reported their results from a study of glycerine esterification of tall oil. The optimum esterification temperature was found to be 275C. Fatty acids are almost completely esterified when rosin acids esterification becomes appreciable at a temperature of about 190-200C. A temperature of 275C. is required to esterify rosin acids to a low acid number.

Recovery of crude sulphate turpentine has become of economic importance with the development of a stable market for this product, said M. R. Dusenbury and J. E. Reese, Hercules Powder Co. Southern pulp mills recover up to four gallons of sulphate turpentine per ton of pulp. Corrosion of tank cars can be prevented by the addition of ammonium hydroxide to the crude sulphate turpentine.

Modern trends have brought about a tremendous expansion of semichemical pulping processes, said C. W. Converse, Sprout, Waldron & Co. A more recent development, now becoming increasingly important, is the production of bleached semichemical pulp which possesses characteristics making it very attractive for use in many grades of paper and paperboard. The burst, tensile and tear strengths of bleached semichemical pulps are higher than those of bleached softwood sulphite. Three commercial semichemical processes were described by the speaker—the neutral sulphite, the sulphate, and the cold caustic. Of these, only the neutral sulphite process is used for bleached pulp production.

Chemical Methods and Pulp Testing

Methods of determining copper in wood pulp, pentosans in highly purified wood pulp, lignin in semichemical pulps, and the sampling of wood pulp for moisture determination were discussed at this meeting. Chairmen were A. S. O'Brien, Eastman Kodak Co., and L. V. Forman, Scott Paper Co.

Fundamental Research

Important accomplishments in fundamental research disclosed at this meeting included a comprehensive study of dye adsorption on wood pulp; ignition temperature studies on certain pulps and other wood products; theoretical discussion of alkaline peroxide bleaching; manufacture and properties of chlorine dioxide, and air drying of paper. Harry F. Lewis presided over the meeting.

E. F. Thode and co-workers, University of Maine, described a rapid method for the evaluation of the specific external surface of pulp fibers. Taking the saturation value in the adsorption process, and knowing the area of the dye molecule used, one can calculate the apparent area of the fibers, said Mr. Thode.

In a paper by M. A. Buchanan, the Institute of Paper Chemistry, reviewed by Dr. Harry F. Lewis, the ignition temperatures of sulphite and kraft pulps were shown to be 264C., while the ignition temperatures of groundwood and semichemical pulps and wood were in the range of 210-230C. The lower ignition temperatures of semichemical pulps

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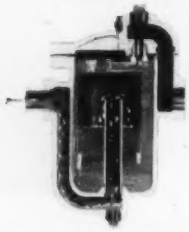

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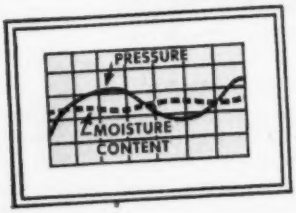

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and groundwood are attributed to the presence of lignin and hemicelluloses, which have an ignition temperature of 180C.

Although chlorine dioxide is a highly explosive chemical, safe and effective ways have been found for its manufacture and handling, it was disclosed in a paper by E. Kesting, Elektrochemische Werke. However, the chemical must be manufactured near the place of utilization, since the problems of transporting it in liquid form have not yet been solved. In the Kesting process chlorine dioxide is manufactured from hydrochloric acid, water and a current of electricity. Sodium chlorate is used as a carrier for the required oxygen. It is circulated continuously between the dioxide reactor and the electrolytic cell for purposes of regeneration. Apart from the initial charges of sodium chlorate and sodium chloride no further additions are required. The process is continuous and lends itself to automatic control.

Graphic Arts

At this meeting new developments of wide interest to the industry were reported. Highlights among the topics were mechanical sheet counting; pick-testing of offset papers, and the relation of paper to gravure printing. Chairman of the meeting was Fred D. Elliott, Time Inc.

A comprehensive review of the new developments in the graphic arts was presented by R. H. Simmons, Government Printing Office, Washington, D.C.

Charles Stevens, Charles Stevens Inc., surveyed mechanical counting equipment and discussed various procedures and operational data. Mechanical sheet counting, he said, can reduce manual counting line costs by as much as 50 per cent.

Corrugated Containers

The corrugated containers program, under the chairmanship of F. D. Long, Container Corp. of America, comprised two symposia—one on corrugated starch adhesives and the other on corrugated silicate adhesives. The symposium on corrugated starch adhesives included a discussion on replies to a questionnaire in which the corrugated box industry for the first time pooled technical information. This symposium also included: starch formulations and control of starch viscosities; one-starch systems vs. two-starch systems; operational problems such as fluff, flutter, and fingerlines; heat balance on a corrugator, and testing and quality control.

The symposium on corrugated silicate adhesives examined the replies to the silicate adhesives questionnaire and then dealt with such problems as the effect of varying compositions of silicate on corrugator operation; proper mechanical adjustment for good corrugator operation; clearances on the corrugator, and steam supply and evacuation.

J. E. Killinger, Penick & Ford, Inc., discussed basic corrugating starch formula for producing regular and waterproof adhesives and pointed out the functions played by the various ingredients, the carrier, and the raw starch portions.

Discussing testing and quality control of corrugated boxes, D. P. McNelly, Fort Wayne Corrugated Paper Co., suggested that, instead of relying on testing finished boxes, inspectors should check on each manufacturing step during plant operation to ensure better quality control.

The ratio of sodium oxide to silica is a deciding factor in obtaining high efficiency of corrugator performance, according to J. G. Lander, Diamond Alkali Co. As a rule, faster setting results with increasing content of silica.

Charles D. Nitchie, Samuel Langston Co., stressed three factors in the design and operation of a corrugator, since they are of prime importance in determining the quality of the manufactured board. These factors refer to the design and production of a flute contour to produce board of high strength, maintenance of adequate temperatures at the surfaces of corrugator rolls, and proper adjustment of the adhesives mechanism to achieve adequate bonding without distortion of the formed flutes. All three factors are held to be of equal importance.

Gordon C. Wheeler and Robert F. Reed, Lithographic Technical Foundation, described a simple pick tester which operates on the offset principle. It consists of a pendulum carrying a spring-loaded hammer. The hammer produces an ink impression by impact. Standard tack-tested inks are used, and both tack and speed can be varied in the pick tester.

Plastics

The discussion on plastics, led by E. C. Jahn, State University of New York, comprised a test for the evaluation of the suitability of wood pulps for acetylation purposes; production of purified hardwood pulps for acetylation; the use, deposition and properties of polyamide resin suspensoids, and new applications of polyester resins, laminating and molding compounds.

The test for the evaluation of the suitability of wood pulp for acetylation purposes, as reported by R. C. Blume, E. I. du Pont de Nemours & Co., Inc., furnishes results in terms of (1) overall reaction rate, (2) rate of degradation of the produced cellulose acetate, and (3) rate of disappearance of filter plugging particles from the acetylation mixture. The method was applied to the study of several alternative processes for the preparation of acetylating pulps

Raymond S. Hatch is 1952 TAPPI Medalist

Award of the 20th TAPPI medal was made to Raymond S. Hatch at the annual association luncheon February 21 at the Commodore Hotel. The presentation was made by Robert B. Wolf, consultant of New Canaan, Conn.

Mr. Hatch, now organizing a research department for Hudson Pulp & Paper Corp., Palatka, Fla., began his career in paper manufacturing in 1912 as chemical superintendent for Crocker McElwain Co. in Holyoke, Mass. Later he spent five years with Hammerslie Mfg. Co., and from there he went to Neenah Paper Co. Mr. Hatch assisted in designing the first mill of Fraser Ltd. at Madawaska, Maine, after which he was made manager of the Peerless Paper Div. of Mead Pulp & Paper Co., Dayton, Ohio. He then spent two years as manager of the East Hartford Mfg. Co., followed by six years with Pulp Bleaching Corp. In 1933 he was named director of research for Weyerhaeuser Timber Co.'s pulp division, resigning in 1948 to establish his own consulting firm in California. It was in the early part of 1952 that he joined Hudson Pulp & Paper in his present capacity.

R. S. Hatch, TAPPI medalist for 1952

A graduate of Syracuse University, Mr. Hatch also studied at Massachusetts Institute of Technology. He is a charter member of TAPPI and served as president of that organization in 1919 and 1920.

from aspen, and the results showed that products from prehydrolysis-sulphate and ammonia-base sulphite pulping will acetylate with equal ease if proper combination of bleaching steps are chosen.

F. A. Simmonds and co-workers of Forest Products Laboratory reported the production of purified sulphite and sulphate aspen pulps suitable for chemical conversion. These pulps were made by the ammonia-base sulphite process and the prehydrolysis-sulphate process. The pulps thus obtained were acetylated at an industrial laboratory and then made into yarns which were shown to be as strong as those made from commercial pulps of acetylation grade.

Five types of polyamide resins are now available in water dispersions, said Harold Wittcoff and co-workers of General Mills Inc. These polyamide suspensoids are readily deposited and dry rapidly. In order to obtain a continuous film the deposited resins must be fused for a few minutes at about 120C. The fused film shows excellent resistance to water, water vapor, grease, dilute acids, alkalis, solvents and chemicals. The films can be heat-sealed at relatively low temperatures. What makes these polyamide suspensoids especially attractive is their compatibility with polyvinyl acetate emulsions, producing blends of desirable quality. Specially treated to reverse their charge, these suspensoids can also be made compatible with natural and snythetic rubber latices, vinyl and acrylic emulsions, rosin and wax emulsions, caesin dispersions and most of the widely used paper coating materials.

Microbiology

This meeting, under the chairmanship of R. F. De Long, Marathon Corp., surveyed a method of laboratory evaluation of potential slimicides; performance of paper machine wet felts with emphasis on the plugging of felts; a method for the evaluation of antimycotic properties of paper and paperboard, and factors affecting slime growth.

S. I. Cohen and Marcine Kahm, Gallowher Chemical Corp., described their modification of the standard Petri plate method, which resulted in improving the accuracy of several steps. An accuracy of 92.3 per cent was achieved with slimicides that could not be assayed with the plate method. The new method, it is hoped, will permit the development of dosage-response data to be used in the interpretation of the dynamic relations between microorganisms and antiseptics.

With regard to plugging the felts, D. W. French and co-workers, University of Minnesota, said they do not hold aggregations of bacteria solely responsible for extensive plugging, but the presence of bacteria may increase the amount of plugging caused by other materials.

L. J. Vinson, Lever Bros. Co., described his method for measuring the resistance of specially treated paper and paperboard to attack by mold strains associated with soap spoilage.

Preparation of Papermaking Materials

Among the subjects discussed by this group were mechanical correction of two-sidedness; use of graphic panels in the paper industry; the Beatapulper; handling materials in the paper industry; the hammermill dirt separator, and the use of the chlorine dioxide bleaching process. F. S. Klein, Byron Weston Co., was chairman of this group.

Two-sidedness is caused by heterogeneity of fiber furnish, fillers and coloring matters, it was stated in a report by M. L. Landberge and co-workers of General Dyestuff Corp. The defect is difficult to correct if caused by unequal length and density of fibers, because fine fibers are removed from the wire side of the sheet in preference to the long fibers. If caused by unequal distribution of fillers, the defect may be remedied by replacing filler at the quide roll, size press or at the coating unit. Two-sidedness caused by unbalance of color is probably easiest to correct, the authors stated.

Arthur W. Infanger, Cowles Co., described the Beatapulper—a unit which combines the functions of the pulper, beater, and refiner. The unit can be furnished like a pulper and the stock slushed, defibered, refined, hydrated, and shortened as desired. It is usually operated on a batch cycle. Size, color, alum and other chemicals can be added to the pulper. A comparison of the performance of a Beatapulper, using a 100 per cent bleached Tacoma kraft furnish, with that of a standard commercial refiner shows that the bursting strength of the Beatapulper product is 106, as against that of the standard refiner of 66. The corresponding figures for C. S. freeness are 475 and 182, and for tear 258 and 115.

Materials handling problems are among the most important in the paper industry, said L. O. Millard, Link-Belt Co. At least four carloads of pulpwood, chemicals, coal, and other materials must be processed for every carload of paper shipped. Mr. Millard emphasized the importance of mechanization of materials handling methods and gave an example which showed that in one case the mechanization of the mill room alone had saved the industry an estimated $100,000 annually. Mechanization had resulted here in reduction of shifts from three to two, wood saving was accomplished through greater wood utilization, and there was considerable reduction in maintenance costs.

E. L. Rastatter and A. H. Croup, Hammermill Paper Co., described the development of a centrifugal-type cleaning device which effectively removes small and low specific gravity dirt particles from pulp and paper furnishes. Advantages of chlorine dioxide bleaching were discussed by H. R. Murdock, a consultant from Atlanta, Ga. He pointed out that, although the chemical is recognized as an exceptionally good bleaching agent, the industry has been reluctant in adopting the chlorine dioxide process on erroneous grounds that it requires heavy capital expenditures and a technical knowledge which is beyond the average mill requirements.

Wet Strength

Problems of wet strength, property of extreme importance in the manufacture of paper, were discussed under the chairmanship of Kenneth W. Britt, Scott Paper Co.

J. Vernon Kindall and J. B. Davidson, Libbey-Owens-Ford Glass Co., reported that wet strength due to urea-formaldehyde resin was increased under low pH conditions and in the absence of sizing materials. They also found that prolonged contact of the resin with pulp decreased felt plugging with resin.

R. H. Walsh, E. I. du Pont de Nemours & Co., discussed new methods of adding neoprene latex to pulp.

Other papers dealt with problems of testing wet strength, mill control methods of wet strength and stress-strain behavior of wet strength paper.

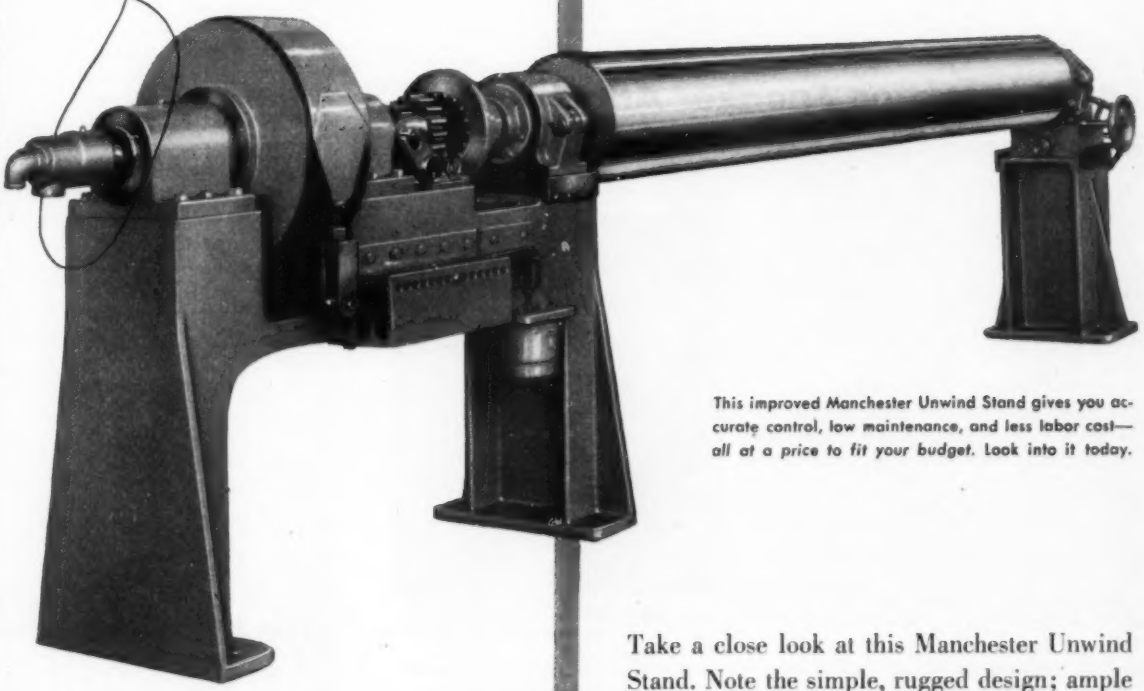
Structural Fibrous Materials

The papers dealing with structural fibrous materials discussed the use of asphalt emulsions in the manufacture of insulating board products, adaptability of the General Electric puncture tester, drying of insulating board and activities of the structural fibrous materials committee. E. M. Jenkins, Johns-Manville Corp., presided at this meeting.

Advantages of the use of asphalt emulsions in insulating board were discussed by J. J. Perot of the Flintkote Co., and various techniques were described for incorporating these emulsions into insulating board stock.

Component parts of a modern roller dryer adopted for drying insulating board were outlined by H. Jessen, Johns-Manville Corp. He discussed in detail the dryer structure, the feeding and discharge sections, the air circulating system, and the use of steam, gas and oil as heating media. The migration of moisture in the insulating board during evaporation was treated from the theoretical aspect, and the three distinct stages in the drying process explained.

Here's an inexpensive UNWIND STAND with many new features!



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Take a close look at this Manchester Unwind Stand. Note the simple, rugged design; ample size water-cooled brake; welded steel housing, and air or mechanically operated tension adjustment—all of which assure uniform sheet tension over the complete diameter of the roll.

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1911 CENTRAL AVENUE • MIDDLETOWN, OHIO

SPECIALISTS IN PAPER MILL MACHINERY AND COMPLETE REPAIR SERVICE

The paper also covered dryer efficiencies and showed formula developed for efficiency calculation.

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TAPPI Luncheon Speaker Attacks Handling of Manpower

The Soviet Union may win world leadership in 20 years without having to resort to war if the United States fails to overcome its critical shortage of scientific and technical manpower, according to Dr. Walter J. Murphy. Dr. Murphy, editor of *Industrial and Engineering Chemistry*, Washington, D. C., addressed the annual luncheon February 21, which closed the national TAPPI convention in New York, N. Y. The gathering was held in the grand ballroom of the Commodore Hotel.

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When it comes to total manpower, the United States can never hope to match the Iron Curtain countries, Dr. Murphy pointed out, and that is why the safety of the United States depends so much upon superiority in science and technology. Yet, he said, if World War III were to break out tomorrow, the chances are "we would duplicate on technical manpower all the incredibly stupid mistakes of World War II," and would be defeated.

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Selective Service Flaw

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Dangerous as the present shortage of technically trained men may be, Dr. Murphy added, it threatens to become worse during the next few years as the result of a steady decline in the number of scientists and engineers being graduated from college. In the engineering field, he stated, there were 50,000 graduates in 1950—a record total made possible by the thousands of veterans who took advantage of the educational provisions of the G. I. Bill of Rights.

"Prior to the outbreak in Korea, it was estimated that at least 30,000 to 40,000 engineering graduates a year would be needed to keep the pipelines filled," Dr. Murphy continued. "Now we discover that for the next four years there will be steady decline in the number of graduates and that along about 1954 the number will be somewhere between 12,000 and 17,000. And, of course, a relatively high percentage of those graduated will be taken by the armed forces. While statistics on scientists are not as readily available as they are for engineers, it is very evident the supply of individuals with Ph.D. training is declining and the number will continue to decline at least through 1960."

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WHAT MORE COULD YOU WANT?

SCHMIDT & AULT PAPER CO.
YORK, PA.

November 7, 1951

Electric Eye Equipment Co.
6 West Fairchild St.,
Danville, Illinois

Gentlemen:

In reply to your recent inquiry on the benefits which we are receiving on our Cylinder Machine from our Hurletron Control, we believe that they may be best enumerated as follows:

Helps considerably in making basis weight changes.
Holds weight and caliper closer to specifications.
Indicates unbalance in vats or sheet out of level.
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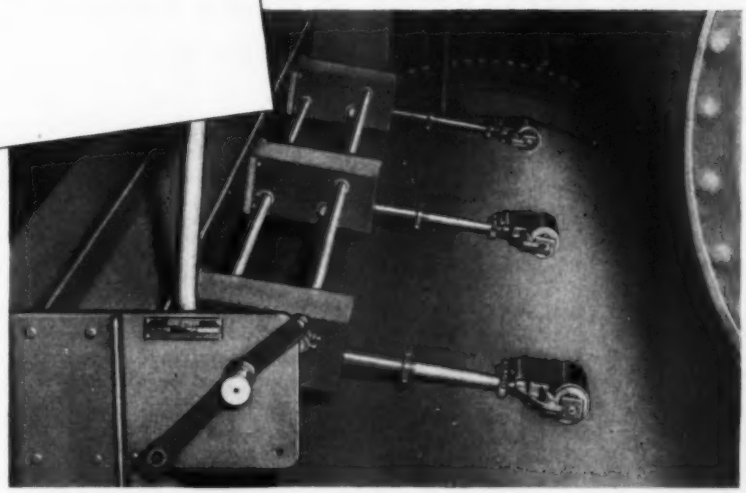
HDS:MH



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10 WEST FAIRCHILD STREET • DANVILLE, ILLINOIS

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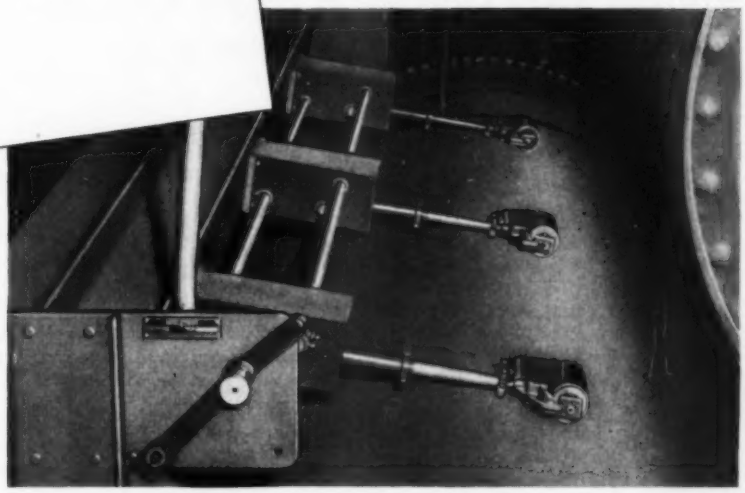

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LEADERS OF THE INDUSTRY as head table guests at the annual SAPI luncheon, held at the Waldorf-Astoria's grand ballroom; Sen. Everett Dirksen of Illinois spoke

Annual SAPI Luncheon Hears Dirksen Warn of Socialism Threat in U. S.

The continued trend toward socialism in the United States is a severe threat to this country's economic system, Sen. Everett M. Dirksen (Rep., Ill.) warned in an address February 22 before the 33rd annual luncheon of the Salesmen's Association of the Paper Industry. Addressing more than 1,600 members and guests in the grand ballroom of the Waldorf-Astoria, Sen. Dirksen said that to "preserve the catalyst of a free market, the defenders of this faith must understand it and speak up for it."

To sell the business enterprise of the free market to the American people, he continued, is the colossal sales job facing salesmen today. The senator gave the following formula for success in American business: "More goods and services for more people in more quantities at the prices the consumers want to pay."

Tilden Elected President

Following the address by Senator Dirksen, W. J. Tilden of Mead Sales Corp., Chicago, was introduced as the SAPI president for the coming year. He received the gavel from George M. Watson, also of the Mead organization, who as retiring president served as toastmaster at the luncheon. Mr. Tilden was elected to his post at the annual SAPI meeting February 19.

Three factors have contributed to the success of the American system, the Illinois legislator declared: Production, distribution, and the free market. This system "is in danger because of a movement toward American-style socialism" in which free decisions, essential to a free market, are unknown. "The essence of socialism is control," he said.

Scoring the federal budget and unnecessary expenditures, Senator Dirksen reminded his listeners that "another reason why our system is in danger is because of 'Operation Exhaustion,' by which the incentives and initiative of business management is being liquidated by the colossal spending and taxation of the federal government. . . . If we run out of dough, there will be no Marshall Plan for us.

"The foundation for freedom and the free market lies in the power of the people, and once the will to remain free is destroyed, no legal or economic barriers will save our system from destruction."

Lyman Receives President's Award

It was announced at the luncheon that E. R. ("Ted") Lyman of Missisquoi Corp. had been selected to receive the President's Award. Presented in honor of George K. Gibson, the association's first president, the award goes each year to the member who has made the most outstanding contribution to the industry.

In addition to Mr. Tilden, SAPI officers elected for the coming year are as follows: Western vice president, H. M. Early of International Paper Co.; assistant western vice president, Arthur Brown of Rex Paper Co.; eastern vice president, L. Worthington Dodd of Champion Paper & Fibre Co.; assistant eastern vice president, Marvin A. Vanderheiden, Nekoosa-Edwards Paper Co.; Boston and New England vice president, David Cheever Jr., Hollingsworth & Whitney Co.

W. J. Tilden, who was chosen SAPI's 1952 president

Sen. Everett M. Dirksen, who gave the main address at the SAPI luncheon

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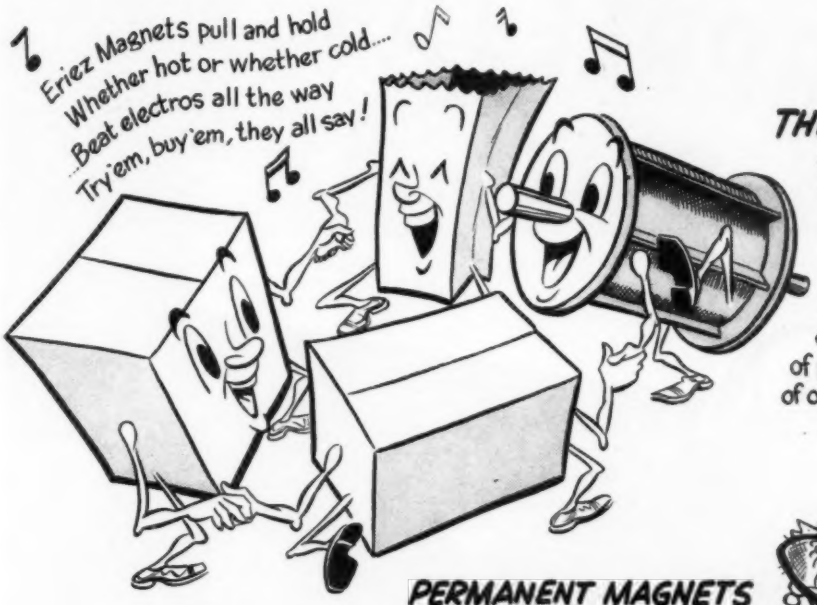

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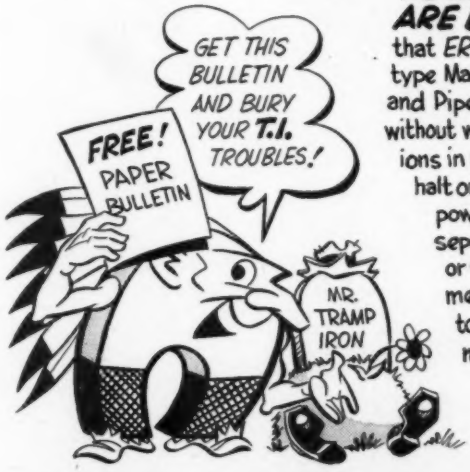

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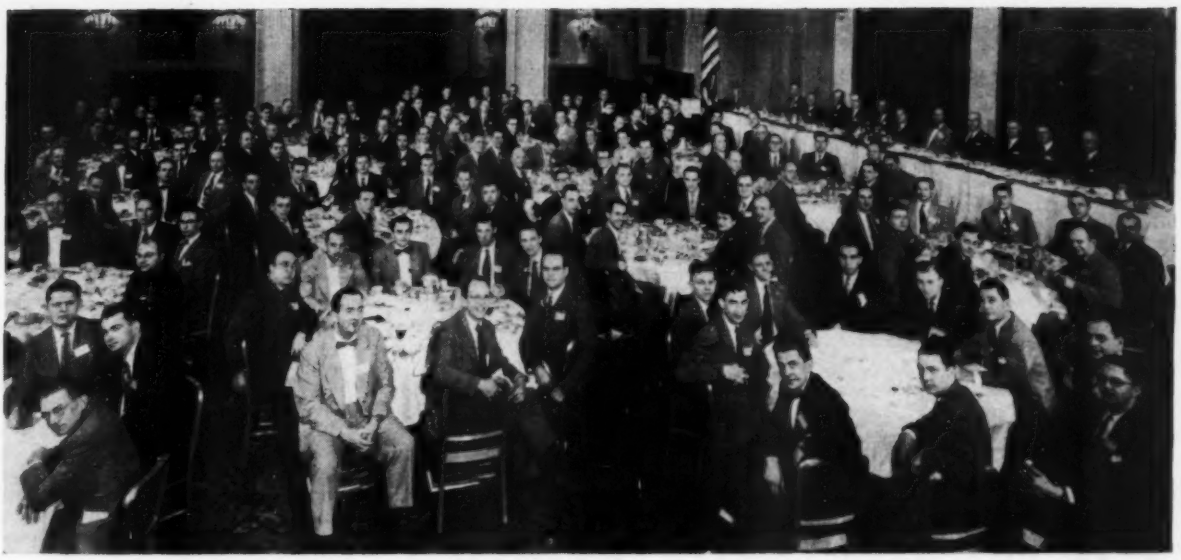

HONORING THE CLASS OF '27, the pulp and paper alumni of the College of Forestry, State University of New York, gather for their annual luncheon during "Paper Week" in New York

Forestry College Alumni Luncheon Honors Class of 1927

One hundred sixty-two members and guests attended the 18th annual luncheon of the Pulp and Paper Alumni of the College of Forestry, State University of New York, held on February 20, 1952, in the Hendrick Hudson Room of the Hotel Roosevelt, New York, N.Y. The luncheon was part of Paper Week, which featured the annual meetings of APPA and TAPPI.

The occasion was designated as honoring the class of 1927 on its 25th anniversary. The eight members of this class are as follows:

C. M. Connor, manager of research and development department, W. C. Hamilton & Sons Co., Miquon, Penn.

R. E. Dick, retired.

Robert F. Huntley, vice president and general manager, Cowles Chemical Co., Cleveland, Ohio, and director of Cowles Co., Cayuga, N.Y.

George B. Martin, sales representative, General Dyestuff Corp., New York, N.Y.

W. Leroy Neubrech, special assistant to the director, Pulp, Paper and Paperboard Division, U. S. Department of Commerce, National Production Authority, Washington, D.C.

Melvin N. Roberts, personnel superintendent, E. I. du Pont de Nemours & Co., Inc., Chattanooga, Tenn.

Arthur G. Scutt, research engineer, Carborundum Co., Niagara Falls, N.Y.

C. Frederick Young, research department, Tecnifax Corp., Holyoke, Mass.

Chairman Walter B. Morehouse, manager, Paper Chemicals Division, Nopco Chemical Co., Harrison, N.J., presided.

Following an invocation by Morris Townsend, executive vice president, Axe Securities Corp., New York, greetings of the Alumni Association were extended to its Pulp and Paper Section by President Francis S. McManus.

Robert F. Huntley spoke for the class. He mentioned situations and incidents of historic note that occurred during the graduating year of 1927.

Prof. C. Earl Libby reported several changes that have taken place in the College staff, among them the retirement of Dean Joseph S. Illick; and the resignation of Ed Ruckdeschel, who had installed and operated the paper machine at the College since 1937. Professor Libby expressed the hope that proposed introduction of bills in the State legislature that would harmfully affect relations between the College of Forestry and Syracuse University, might be settled very soon on a basis of some satisfactory compromise.

The formal speaker at the luncheon, aptly called the "minute man" for having accepted the invitation on short notice, was Mr. Fen K. Doscher, vice president in charge of sales of the Lily-Tulip Cup Corp., New York, N.Y. His talk was a forceful and inspiring address on marketing of products, which, he said, regardless of their perfection, must be fitted to a need and then vigorously sold.

Printed programs of the luncheon were a gift of THE PAPER INDUSTRY magazine of Chicago.

THREE CLASS MEMBERS attending the luncheon were (l. to r.): R. F. Huntley, George Martin and C. M. Connor

Record Number of Divisional Group Meetings Held During APPA Convention

Affiliated groups and divisional associations held extensive meetings during the five days of the national APPA convention in New York, N. Y., February 18-22. Approximately 100 such annual meetings, together with special committee and group gatherings, were staged at the Waldorf-Astoria Hotel.

Yearly elections of officers were announced, and reports on the activities of the past year presented. Many of the organizations also held extensive discussions on their particular problems of manufacture and distribution, while headline speakers from government and industry alike were heard in talks on current business and governmental developments.

Writing Paper Manufacturers Hear Address by Newscaster

At the 91st annual meeting of the Writing Paper Manufacturers Association, Eric Sevareid, chief Washington correspondent for CBS, declared that the outcome of the present situation in Korea will have a direct effect on the results of the national elections in November. He spoke at the association's annual dinner, which was staged February 20 at the Waldorf-Astoria Hotel.

Mr. Sevareid warned that the failure of a truce now or the breaking of a truce if one is effected will seriously hurt the party in power. In the event of a cessation of fighting, he declared, the Republican candidate would have to cut deeply into the independent vote to carry the election.

Other speakers during the various meetings of the association included N. H. Bergstrom, chairman of APPA's community relations committee; J. L. Ritchie, executive director of the U. S. Pulp Producers Association; M. C. Dobrow, executive secretary of the association; W. L. Neubrech, assistant to the director of the Pulp, Paper and Board Division, NPA, and W. R. Settgas, secretary of the APPA traffic committee.

Bruce Crane of Crane & Co., Inc., Dalton, Mass., was reelected president of the association. Elected vice president and chairman of the Sulphite Bond Group was J. H. Goodwin of International Paper Co., New York, N. Y. Reelected vice president and chairman of the Rag Content Paper Group was Hale Holden of Byron Weston Co.

Mr. Crane was also made association representative on the APPA board of governors. G. E. O'Connor of Mohawk Paper Mills, Inc., was elected alternate representative. M. C. Dobrow was reelected executive secretary-treasurer, and Miss Olive F. McGill was reelected assistant treasurer.

Elected to the executive committee were H. A. Stone Jr., Riegel Paper Corp., representative of the Bristol Board Group; Mr. O'Connor, representative of the Cover and Text Paper Group, and M. Peter Schweitzer of Peter J. Schweitzer, representative of Thin Paper Group.

Members elected to the executive committee representing the Rag Content Paper Group were Mr. Holden, chairman; M. D. Bardeen of Lee Paper Co.; F. N. Bridgham, Strathmore Paper Co.; D. K. Brown, Neenah Paper Co.; T. M. Gilbert, Gilbert Paper Co.; R. S. Madden, Valley Paper Co.; F. E. May, Rising Paper Co., and William Whiting, Whiting Paper Co.

Representatives of the Sulphite Bond Group elected to the executive committee were Mr. Goodwin, chairman; W. J. Garrity of Munising Paper Co.; W. L. Jennings, West Virginia Pulp & Paper Co.; H. W. Kampf, Mead Corp.; A. C. Remley, Nekoosa-Edwards Co.; David Smith, Wausau Paper Mills Co.; H. W. Suter Jr., Champion Paper & Fibre Co.; W. B. Zimmerman, Howard Paper Mills, Inc., and J. D. Zink, Hammermill Paper Co.

Tissue Association Hears Leon Henderson

Leon Henderson, wartime head of OPA, addressed a special meeting of the Tissue Association, Inc., February 19. Quoting Bernard Baruch, Mr. Henderson warned that "the gravest threat is still military defeat abroad and further inflation at home." He further declared that price control mechanisms today are better than those in effect during the war and better than any totalitarian system enjoys.

New officers of the Tissue Association for the coming year are: C. E. O'Connor Jr., Diamond Match Co., president; William J.

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Morningstar's modern laboratories and technical experts can lend you valuable aid on your Dextrine, Starch and Adhesive problems. Years of intensive research have resulted in the development and perfection of a specialty line of exclusive products for the paper industry. Without obligation, our paper specialists will gladly study your individual mill requirements and recommend the most efficient and economical formula to improve the operation you describe.

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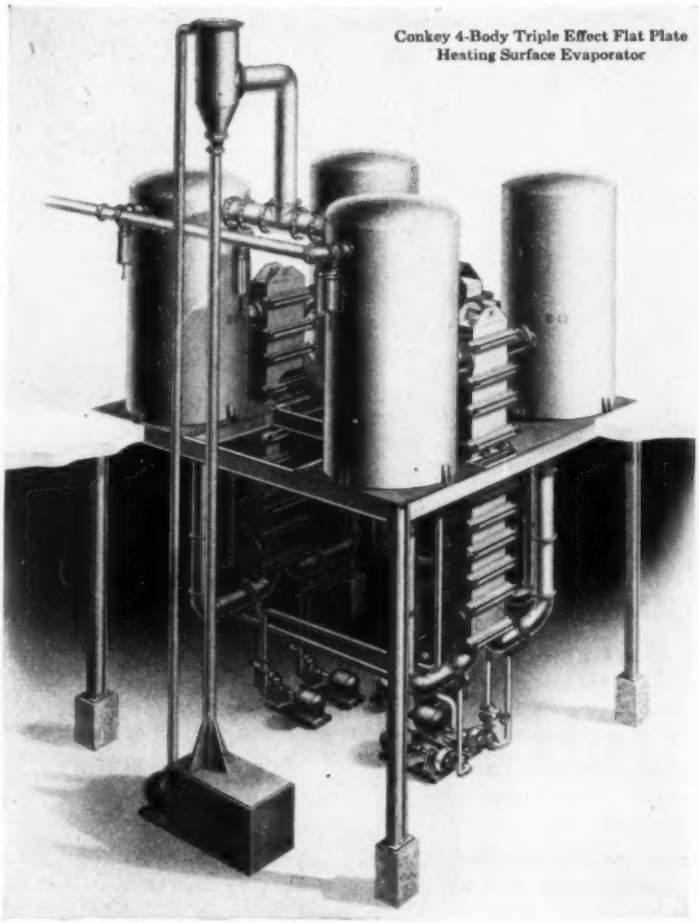

Conkey 4-Body Triple Effect Flat Plate Heating Surface Evaporator

Conkey Flat Plate Heating Surface Evaporator *with Rosenblad Switching System**

The proven system for avoiding stream pollution by sulphite pulp mill waste liquors that proved so outstandingly successful in commercial installations all over Scandinavia, is now adapted for use in this country by General American. *In every instance* where a Rosenblad Switching System has been installed, shut down time *and* scale removal *costs have been practically eliminated!* The Rosenblad System utilizes the condensate wash as a descaling operation carried on during full capacity operation of the evaporator. Surfaces subjected to boiling liquor are periodically switched with those in contact with vapor and condensate to clean heating surfaces during normal continuous operation. *Every part* of the equipment is switched, consequently scale is washed away from pipe lines, valves and vessels . . . in addition to heating surfaces.

At present in this country . . . Rosenblad Switching Systems in Conkey Flat Plate Heating Surface Evaporators are being constructed for full scale commercial operations. *Write today for detailed bulletin.*

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PROCESS EQUIPMENT DIVISION

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Other General American Equipment:
Turbo-Mixers, Filters, Dewaterers, Dryers, Towers, Tanks, Bins, Pressure Vessels

Servette, Bay West Paper Co., vice president; R. W. Sweet, Sweet Bros. Paper Mfg. Co., treasurer, and Ross A. Fife, executive-secretary.

Chairmen of the various product groups are as follows: H. C. Wintgens, Hoberg Paper Mills, toilet tissue; William Medoff, Sitroux, Inc., facial tissue; John McKirdy Jr., Scott Paper Co., paper towels; E. E. Grant, Crystal Tissue Co., wrapping tissue; James F. Suter, Roundout Paper Mills, No. 2 wrapping tissue; E. A. Woolwine, Brooks Paper Co., gift wrappings; W. C. White Jr., Pequannock Valley Paper Co., twisting tissue; Ralph W. Burrows, Burrows Paper Corp., jumbo roll, and John J. Petroske, Patchogue-Plymouth Mills, fibre fabric.

Newly elected directors at large are John J. Cahill, Ben-Mont Papers, Inc.; George C. Dunn, Dunn Paper Co.; W. F. Erisman, Erving Paper Mills, and Joel S. Hartman, Barclay Tissue Corp.

Economic Discussion Highlights Kraft Assn.

Dr. Charles F. Roose, president of the Economic Institute, Inc., addressed the general meeting of the Kraft Paper Association, Inc., February 21. During the session results of the election of officers were announced. Wayne A. Brown of Crown Zellerbach Corp. and Walter C. Shorter of Camp Mfg. Co. were reelected president and vice president, respectively.

The following were elected to the executive committee: W. M. Allin, Southern Advance Bag & Paper Co., Inc.; J. B. Cowie, Hollingsworth & Whitney Co.; H. S. Daniels, Union Bag & Paper Corp.; W. J. Dixon, St. Regis Paper Co.; K. O. Elderkin, Crossett Paper Mills; S. D. Fleet, Albermarle Paper Mfg. Co.; G. F. Henderson, Brown Co.; W. L. Jennings, West Virginia Pulp & Paper Co.; H. C. Lawless, Gilman Paper Co.; William Mazer, Hudson Pulp & Paper Corp.; C. G. McGhee, Calcasieu Paper Co., Inc.; R. A. Nash, Sorg Paper Co., and George Stuhr, Southern Kraft Div., International Paper Co.

Tinker Addresses Sulphite Paper Manufacturers Assn.

"Paper Problems and Prospects" was the title of an address given before the annual luncheon of the Sulphite Paper Manufacturers Association February 19. Guest speaker at the meeting was E. W. Tinker, executive-secretary of APPA. Following the luncheon the annual meeting was convened by Thomas J. Burke, the association's secretary-treasurer.

New officers for the coming year were announced: Donald F. McCall, general chairman; Leo E. Croy, vice chairman (bleached); George Stuhr, vice chairman (unbleached); Wayne A. Brown, vice chairman (manila); Neil M. Nash, vice chairman (glazed), and Gilford F. Henderson, vice chairman (bleached-converting).

Officers of the board of governors are as follows: James G. Conley, Allan G. Hendry, B. W. McEachern, A. P. Mitchell, Alfred Southon. Mr. Burke continues as secretary-treasurer. On the occasion of his retirement as general chairman, Mr. Conley was presented a gold watch.

Coated and Processed Paper Assn. Hears Talks on Government

George Olmstead Jr., retiring APPA president and a member of the paper and pulp advisory committee of NPA, addressed a general session of the Coated and Processed Paper Association February 18. Another speaker on the program of the group was Andrew M. McBurney of OPS' Forest Products Div., who discussed OPS affairs.

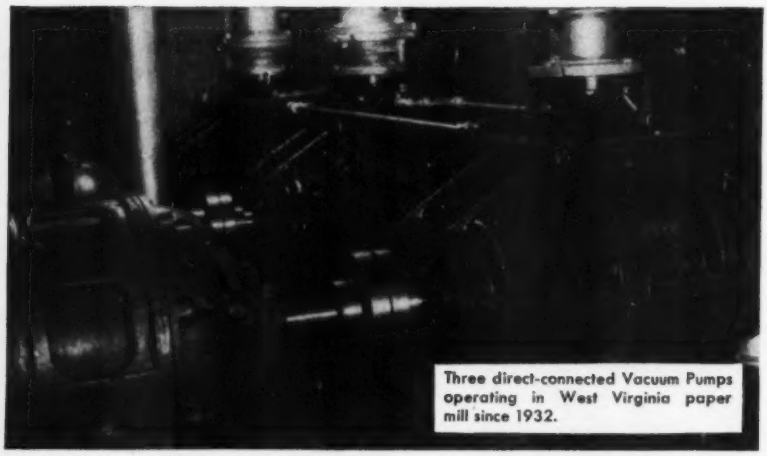
Newly elected president of the association is Spurgeon F. Barndt, Wyomissing Glazed Paper Co.; elected as vice presidents were F. Allan Barr, Holyoke Card & Paper Co., and Bernard B. Novasel of Lachman-Novasel Paper Corp.

Members of the executive committee elected at the meeting include Louis C. Krauthoff, H. D. Catty Corp.; Lawrence R. Clark, Hampden Glazed Paper & Card Co., and Keno E. Tozier of K. E. Tozier Co.

New Developments Discussed by American Pulpwood Assn.

E. O. Ehrhart of Armstrong Forest Co. was elected new president of the American Pulpwood Association at a session of the board of Directors February 21. W. J. Damtoft of Champion Paper & Fibre Co. and L. J. Freedman of Penobscot Chemical Fibre Co. were made vice presidents. Elected executive secretary-treasurer was H. E. Brinckerhoff, while Helen L. Kohler was named assistant treasurer.

Among the many addresses dealing with new developments in the industry were the following: Time and Cost Study of Pulp-



Three direct-connected Vacuum Pumps operating in West Virginia paper mill since 1932.

COMPARE THESE 5 VALUES WHEN YOU BUY VACUUM PUMPS

Outstanding satisfaction with Roots-Connersville Vacuum Pumps for paper mill operation has been gained by their high ratings in these five essentials to adequate performance. Our engineers will gladly work with you in selecting equipment for your specific needs. Send for Bulletin 50-B-13, which deals exclusively with R-C Cycloidal Vacuum Pumps for Paper Mill Operation.

1. **LOW POWER CONSUMPTION**—because units are recommended, either single or compound, to operate at the most efficient point.
2. **NEGLIGIBLE FRICTION LOSSES**—no contact between impellers or impellers and casings.
3. **HIGHER SPEEDS**—permitting direct connection to standard motors, saving first cost, space and weight.
4. **FLEXIBILITY**—to meet varying demands; suction automatically overcomes resistance in system.
5. **DEPENDABILITY**—long-time, attention-free operation, due to simplified design and construction.

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BLOWER BUILDERS R-C SINCE 1854

ONE OF THE DRESSER INDUSTRIES

Typical wool showroom, where buyers make their selections.

Photographs courtesy of Wool Bureau, Inc.

Out Where Huyck Felts Begin

First, the fleece. From 1,500 classified types, buyers choose only those special wools that meet the exacting requirements of Huyck Felts. In the principal wool-growing countries of the world this discriminating selection goes on. For these must be just certain wools, rare and costly.

In they come, to the great wool warehouses at Rensselaer, New York. From this vast supply, skilled sorters select the grades specified for each type of felt, then blend them for the precise task the felt is to perform on the paper machine.

This is the first, and only the first step in making the famous Huyck felts which for 82 years have rendered such essential service to the pulp and paper industry.

KENWOOD TEXTILE PRODUCTS

HUYCK *Felts*

F. C. Huyck & Sons — Kenwood Mills — Rensselaer, N. Y.

wood Logging, G. M. Wilson, Johns-Manville Products Corp.; Application of Punched Card Methods to Pulpwood Scaling, R. G. Belcher, Canadian-International Paper Co.; Use of Sorted Tally Cards in Cruising Timber, James W. Meteer, Ohio Agricultural Experiment Station; Use of Atomic Energy in the Paper Industry, Lincoln R. Thiesmeyer, president of the Pulp & Paper Research Institute of Canada; Aerial Bombing of Fire in Canada, Mr. Thiesmeyer; Continuous Forest Inventory, Cal Stott, forester with the U. S. Forest Service at Milwuakee; Use of Radio to Speed up Pulpwood Production and Procurement, D. C. Cotton, Camp Mfg. Co.; Tree Length Logging of Pulpwood, George Carr, Pacific Car & Foundry Co.; Development of the U. S. Forest Service Timber Sale Policy, George L. Drake, president of the Society of American Foresters; Portable Barker Developments, E. W. Fobes, forester with the U. S. Forest Products Laboratory at Madison, Wis., and the Securing of Priorities on Heavy Logging and Mill Yard Equipment, Frank Heyward, NPA.

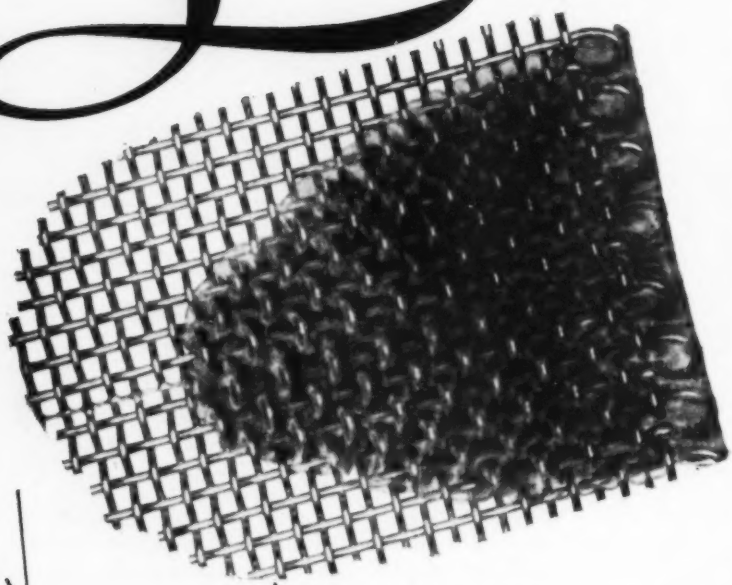
New members of the executive committee are Mr. Ehrhart, H. R. Palmquist, H. G. Schanche, R. R. Drummond, C. O. Brown, Karl A. Swenning, R. W. Lyons, L. J. Freedman, W. J. Bailey, and W. J. Damtoft.

Waxed Paper Institute

J. E. Edelstein, vice president of Rapinwax Paper Co., was elected president of the Waxed Paper Institute February 21. Featured speakers at the Institute's sessions included Burnet Hershey, president of the American War Correspondents Association, and Eugene Hardy of the National Association of Manufacturers.

The executive committee of the Institute was expanded from nine to 11 members. New members are R. D. Halford, Fabricon Corp., and W. P. Paterson, Specialty Paper Co. Reelected to three-year terms were C. F. Christy, Kalamazoo Vegetable Parchment Co., who was also elected vice chairman; George C. Wieman, Western Waxed Paper Co., and Ben F. Lacy, Pollock Paper Corp.

A NEW DEVELOPMENT BY Lindsay



Following considerable research and testing, we now make available to the paper industry a Fourdrinier wire with a plastic seam edge reinforcement (*patent applied for*). The plastic impregnation replaces the standard sewn steel edge and will be incorporated on future wires. This step forward is evidence of our pledge to "*never cease trying*". The Lindsay Wire Weaving Company, Cleveland 10, Ohio.

Lindsay WIRES FOR PAPER MILLS

Groundwood Paper Manufacturers Assn.

Robert Faegre of Minnesota & Ontario Paper Co. was elected president of the Groundwood Paper Manufacturers Association at the group's annual meeting February 19. New eastern vice president is Samuel Pruyn of Finch Pruyn, while the new western vice president is Andrew Sharp of Kimberly-Clark Corp. Robert E. Canfield was named secretary-treasurer.

Representatives on the APPA board of governors are Paul A. Mahoney, International Paper Co.; Edward J. Doonan, Gould Paper Co., and James Conley, Fraser Paper Ltd.

Glassine and Greaseproof Manufacturers Assn.

Paul F. Moore, president of Westfield River Paper Co., was elected chairman of the Glassine and Greaseproof Manufacturers Association at the group's annual meeting February 21. He succeeds Robert F. Nelson of Rhinelander Paper Co., who held the office two years. Thomas J. Burke was reelected secretary-treasurer, and W. W. Corlett was renamed counsel.

The association's executive committee will serve for another year. The committee consists of seven members: Mr. Nelson; Elmer Jennings, Thilmany Pulp & Paper Co.; Arthur Schwab, Hamersley Mfg. Co.; Folker Becker, Rhinelander Paper Co.; J. Lawrence Riegel, Riegel Paper Corp.; Paul E. Hodgdon, Deerfield Glassine Co., and Mr. Moore, the new chairman.

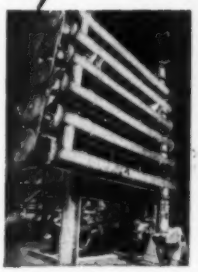
Newsprint Service Bureau, Inc.

John L. Hobson was reelected president of the Newsprint Service Bureau at the annual meeting of the organization February 21. Mr. Hobson is president of St. Croix Paper Co., Woodland, Maine. Gerald E. Young, vice president of Crown Zellerbach Corp., San Francisco, was elected vice president. Retained in their offices were Bernon L. Tipka, secretary, and John J. Zima, assistant secretary.

Elected directors were: Mr. Hobson; R. W. Wortham Jr., executive vice president of Southland Paper Mills; R. O. Sternberger, president of Penobscot Paper Co., and Carl E. Braun, vice president of Publishers Paper Co.

Pulp Imports Discussed by Pulp Producers Assn.

The decline of pulp imports from Scandinavia in the wake of price controls was



PULP DEFIBERED IN ASPLUND DEFIBRATOR

CHEMI-PULPER®
continuous digester

The ever-increasing, world-wide use of the CHEMI-PULPER continuous digester has mill-proved the value of its principle of continuous cooking under controlled conditions. More and more installations are being made in mills using either hard or soft woods to *economically* make pulps of predetermined quality and yield to meet specific requirements. Such pulps are produced for making .009 for corrugating; flooring, roofing and automotive felts, and insulating board. Effects substantial savings in steam, power and labor costs compared with conventional pulping methods. Bulletin C2 gives the facts . . . yours for the asking.

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PANDIA

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discussed at the February 18 meeting of the executive board of the United States Pulp Producers Association. Principal speaker was James L. Ritchie, reelected executive director of the association.

Directors-at-large elected at the meeting were R. M. Buckley, Soundview Div., Scott Paper Co.; A. Calder Jr., Union Bag & Paper Corp.; B. R. Cancell, Rhinelander Paper Co.; C. H. Conrad, Rayonier, Inc.; Willard J. Dixon, St. Regis Paper Co.; Amor Hollingsworth, Penobscot Chemical Fibre Co.; James L. Madden, Hollingsworth & Whitney Co.; Lawson P. Turcotte, Puget Sound Pulp & Timber Co.; Joseph M. Wafer, West Virginia Pulp & Paper Co., and H. E. Whitaker, Mead Corp.

The executive board for 1952 is as follows: for New England, Downing P. Brown, Brown Co.; for Middle Atlantic, D. S. Leslie, Hammermill Paper Co.; for South, Stuart E. Kay, International Paper Co.; for Lake States, W. M. Wright, Kimberly-Clark Corp., and for West, L. K. Larson, Weyerhaeuser Timber Co.

Stream Improvement Council Features Research Discussions

Kraft, sulphite, semichemical waste treatment and aquatic biology problems were featured in the research review and open panel discussion held in connection with the annual meeting of the National Council for Stream Improvement, Inc., on February 21.

Panel members participating in the forum, together with the titles of their papers, are as follows: Anthony W. Pesch, Southern Kraft Div., International Paper Co., "Kraft Mill Waste;" Vance P. Edwardes, consultant, "Sulphite Waste Liquor Problems;" Dr. Harry W. Gehm, National Council for Stream Improvement, "Semichemical Waste;" Prof. R. E. Dimick, Oregon State College, "Aquatic Biology."

At the business session George E. Dyke, chairman of the National Council, stated that despite an increase of more than 50 per cent of pulp and paper production during the eight years that the National Council has been in existence, the total volume and the pollution potential of the waste from industry have shown a steady decrease.

At a meeting of the board of governors the following officers were elected: Chairman, Mr. Dyke; vice chairmen, Clyde B. Morgan and W. Irving Osborne Jr.; treasurer, J. D. Zink, and executive secretary and assistant treasurer, Russell L. Winget.

Elected to the board of governors at the annual business meeting were: D. K. Brown, Alexander Calder, Hugh J. Chisholm, Mr. Dyke, D. C. Everest, R. K. Ferguson, Sydney Ferguson, Sidney Frohman, J. H. Hinman, J. L. Hobson, P. H. Glatfelter, Reuben Robertson II, H. E. Legge, Mr. Morgan, H. W. Morgan, Mr. Osborne, Dwight L. Stocker, M. W. Swaim, Lawson P. Turcotte, George R. Wallace, L. F. Whittemore, Frank N. Youngman, and Roy V. Weldon.

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FOR THESE PAPER-MAKING CHEMICALS

And Get...

EXCLUSIVE TECHNICAL SERVICE

Only SOLVAY offers a *specialized* paper makers' Technical Service manned by skilled technicians who are experts in the paper field.

PROMPT DELIVERY FROM CONVENIENT POINTS

SOLVAY is equipped to serve you without delay from its centrally-located producing plants . . . thirteen branch sales offices . . . and a widespread chain of warehouses and stock points located right in paper-making areas.

QUALITY AND DEPENDABILITY

SOLVAY has served the paper industry for over sixty years—longer than any other alkali manufacturer! This vast accumulation of knowledge and experience tells you that you can depend on SOLVAY for quality paper-making chemicals.

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Admiral Land Addresses Paper Napkin Assn.

One of the strongest bulwarks against totalitarianism is the American system of trade associations, Vice Adm. Emory S. Land told members of the Paper Napkin Association February 20. Adm. Land, president of the Air Transport Association of America, said that trade associations are the essence of teamwork, groups that "pull together for the benefit of all hands."

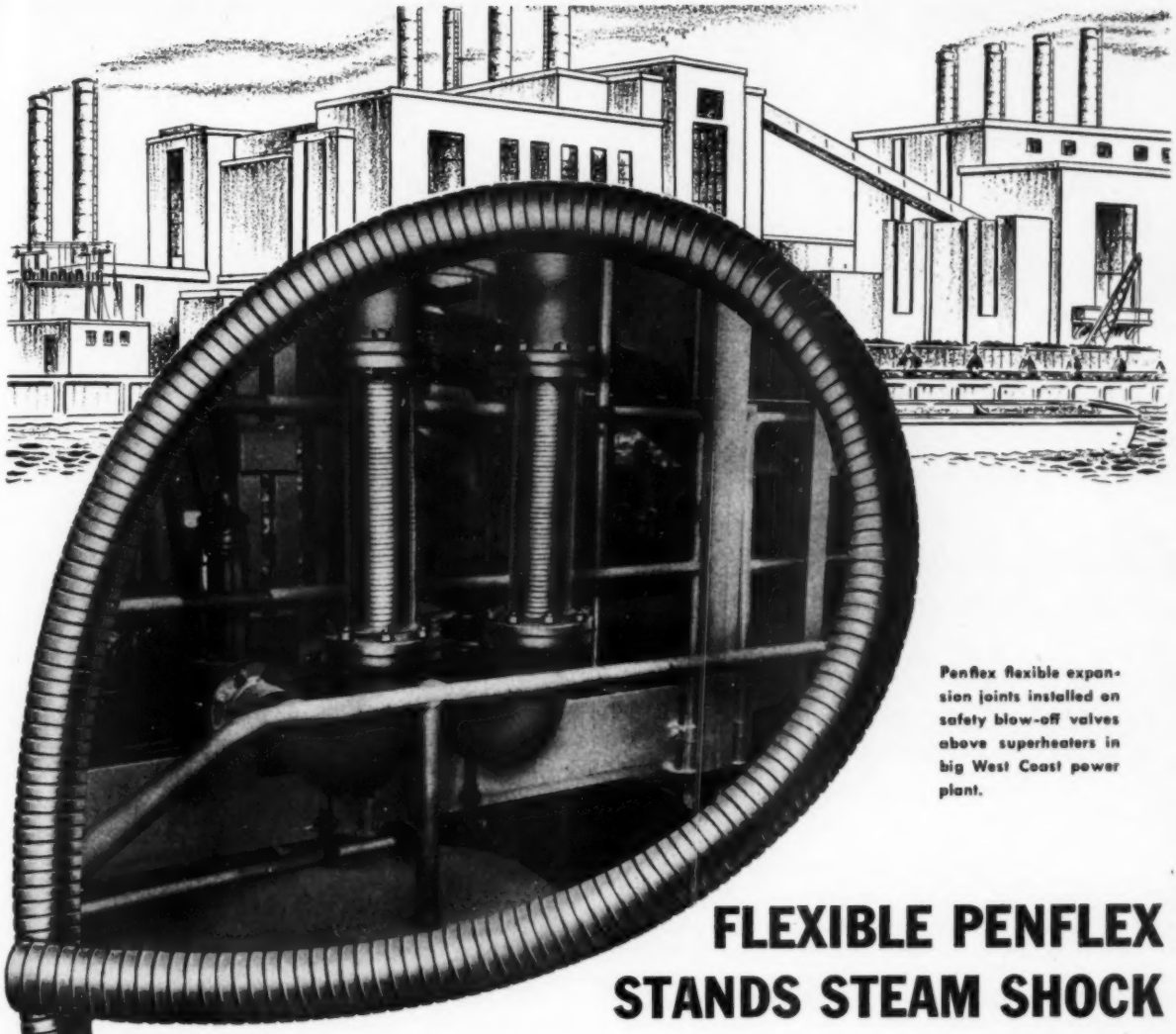
Reelected chairman of the executive committee of the association was B. T. Hoffmaster, Hoffmaster Paper Co. Vice chairmen for the coming year will be Lee Fenstamaker, C. A. Reed Co., and Elmer Krueger, Paper Art Co.

Other members of the new executive committee are Bob Bertram, Marathon Corp.; Irv Zuckerman, Hudson Pulp & Paper Co.; Wally Moore, Crown Zellerbach; Jim Asmuth, Wisconsin Tissue Mills, and Joe Meyer, Groff Paper Co. Arlo Wilson was reelected secretary-treasurer.

Pulp Consumers Assn. Hears Air Force Speaker

Maj. William Beckett of Beckett Paper Co., Hamilton, Ohio, and presently on active duty with the U. S. Air Force, addressed the annual luncheon of the Association of Pulp Consumers, Inc., February 21. Major Beckett, who is attached to the 43d Bomb Wing in Tucson, Ariz., spoke on the subject, "A Papermaker in the Air Force."

New association president is David Knowlton of Knowlton Bros., Watertown, N. Y., who succeeds Robert Evans. Aubrey K. Nicholson was returned to a second term as vice president. He is associated with Collingsworth & Vose, East Walpole, Mass. Karl Classon, for the sixth consecutive year, was named secretary-treasurer.



Penflex flexible expansion joints installed on safety blow-off valves above superheaters in big West Coast power plant.

FLEXIBLE PENFLEX STANDS STEAM SHOCK

PENFLEX TUBING ABSORBS THERMAL EXPANSION . . . PREVENTS BLOW-OUT

Without warning, the safety valves atop these big superheaters suddenly pop. A mighty surge of 900 F, eight-hundred-and-fifty-pound steam blasts through the pipes to exhaust to atmosphere. These pipes have to know how to take it!

Ordinary rigid pipe would blow apart under the terrific thermal expansion. But Penflex flexible metal tubing has enough "give" to take the shock. Six lengths of 8" Penflex interlocked tubing installed as expansion joints on the boiler blow-off line cushion the sudden impact . . . take up any pipe movement due to extreme temperature and pressure changes.

Penflex engineers can help you solve your tough tubing problems. Penflex makes a complete line of 4-wall interlocked and seamless welded corrugated tubing . . . metallic hose, tubing and couplings from ⅛" I.D. up . . . automatic barrel fillers, pneumatic rivet passers, accessories and fittings. Write for illustrated folder "Flexineering." It's a valuable production aid.

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HEART OF INDUSTRY'S LIFE LINES

HEAD TABLE GUESTS at the annual luncheon of the Canadian Pulp & Paper Association included (L to R) S. L. DeCarteret, president of Canadian International Paper Co.; E. M. Little, president of Anglo-Canadian Paper Mills Ltd. and chairman of the CPPA executive board; Sydney Ferguson, first vice president of the American Paper and Pulp Association; D. W. Ambridge, president of Abitibi Power & Paper Co. Ltd. and vice chairman of the CPPA executive board; R. M. Fowler, CPPA president; L. J. Belnap, CPPA executive board vice chairman; Paul E. Cooper, chairman of the CPPA western division; Dr. F. Cyril James, president and vice chancellor of McGill University, and R. L. Weldon, chairman of the board of the Pulp and Paper Research Institute of Canada

Latest Techniques Discussed at CPPA's Technical Session

New developments and research investigations were discussed during the January 23-25 meetings of the Canadian Pulp and Paper Association's technical section. General sessions were held at the Mount Royal Hotel, Montreal, with W. W. Holland of Oxford Paper Co., Rumford, Maine, serving as general chairman.

Highlighting the CPPA meeting was a discussion of the dominant position held by the pulp and paper industry in the Canadian economy—this despite recent popular emphasis on developments in the mineral and industrial fields. (See THE PAPER INDUSTRY for February.)

Delegates, comprising a large number of the section's 1,300 members and the 3,000 members in its 10 branches, came from all parts of Canada; while others attended from the United States, England, Sweden and India.

The program covered industrial fermentation of sawdust; determination of printing quality of newsprint; extraction of oil from boughs and foliage of trees, and the operation of various types of modern pulp and paper-making equipment. Detailed reports of activities of the Association's 17 sections were presented, followed by group discussions dealing with materials handling problems, uses of hardwoods, waste disposal, corrosion of equipment and uses of the bark.

Section Reports

F. F. Arnoldi, chairman of the *Board Section,* said Canadian production of paperboard in 1951 had been 760,000 tons, exceeding the 1950 production by 7 per cent. Due to an increase in the export demand for paperboard in the latter part of the year, the industry had been forced to increase its paperboard-making capacity.

As a result of substantial capital expenditures made by the industry, shipments of book, writing and fine papers to the domestic market topped all previous records, according to W. H. Aird, chairman of the *Book and Writing Section.* Export shipments were also increased but not commensurate with the increased demand for Canadian products in overseas markets.

The *Woodland's Section,* as reported by Chairman Gordon Godwin, held a number of field meetings in 1951 to discuss fire protection, silviculture, mechanical hauling and cable yarding of pulp wood. The section's 14 committees made a study of special pulpwood cars, aerial surveys, nutrition, sleighs, cutting tools, farm woodlots, silvicultural methods, etc. An equipment survey conducted by the section showed that the total number of all kinds of machines used by the industry is now almost three times the number used five years ago.

C. M. Matheson, chairman of the *Chemical Pulp Section,* reported that the production of chemical woodpulp in 1951 had exceeded the 1950 production by 15 per cent, to achieve a record output of nearly 4,000,000 tons. Major production increases were in unbleached sulphite pulp and in bleached and unbleached sulphate pulps. While increased production was accomplished mainly through modernization of equipment as well as more efficient operation of existing mills, a new bleached sulphite mill of Columbia Cellulose Co., and the reopening of an unbleached sulphate mill by Howe Sound Pulp Co., contributed their share.

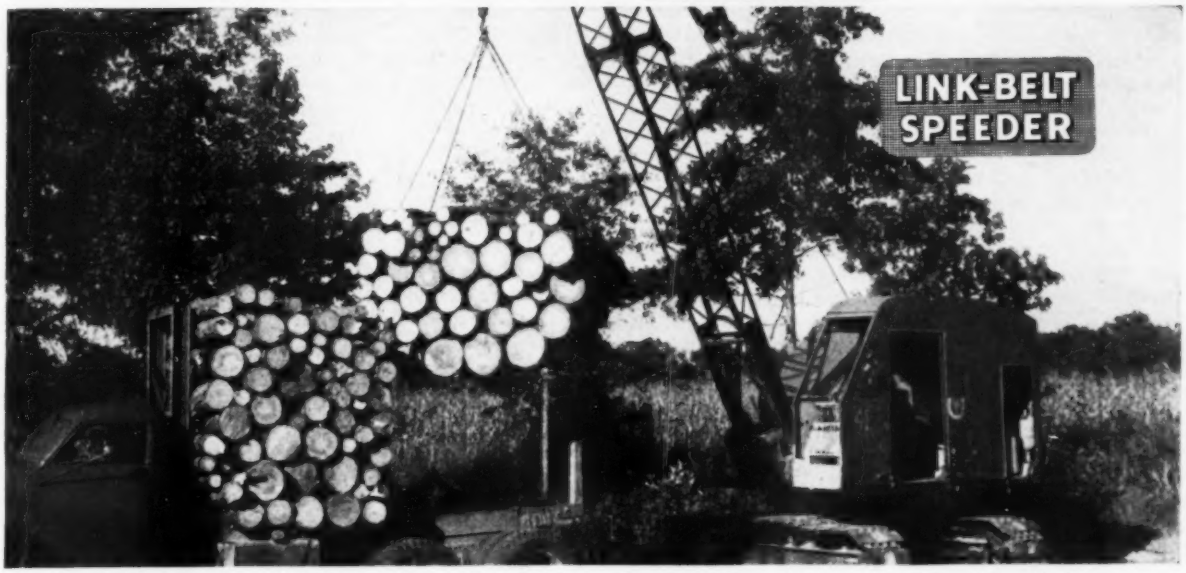
The chairman of the *Mechanical Pulp Section,* E. J. Thom, reported that Canadian groundwood pulp output in 1951 had been 5,135,000 tons. It marked the fifth consecutive year of record groundwood pulp production, the increase in 1951 exceeding that of 1950 by about 5.4 per cent. Demand in Canada, the United States and overseas countries remained strong. Approximately 78 per cent of surplus groundwood pulp was shipped to the United States, 15 per cent went overseas, and 7 per cent was supplied to the Canadian market.

An interesting presentation of transportation data on the industry's raw materials and finished products was made by W. B. Daley, chairman of the *Traffic Section.* The Canadian pulp and paper industry's freight bill in 1951 was about $200,000,000. The railways carried some 275,000 carloads of pulpwood and about 250,000 carloads of pulp and paper. There was also a sharply increased volume of water-borne tonnage. During the year the Traffic Section had dealt with such problems as car supply, freight rates, transit damage, maximum car loading and demurrage. The Section also entered in a discussion with the railways on the possibility of supplying specially-designed pulpwood cars.

A report by Paul E. Cooper, chairman of the *Western Division,* showed that the British Columbia pulp and paper industry, comprising 10 companies operating 12 mills, almost doubled in size and production during the past five years. The growth has received a strong impetus with the opening of a new rayon pulp mill by Columbia Cellulose Ltd., the modernization and re-opening of the Howe Sound Pulp Co., Ltd., sulphate mill, and the newsprint and sul-

up to 25% more production

LINK-BELT SPEEDER with *Speed-o-Matic* controls

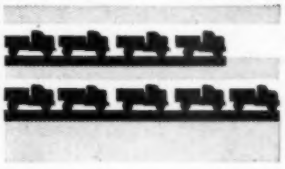


Full hydraulic Speed-o-Matic controls on this Link-Belt Speeder LS-51 give you the perfect "touch" for accurate placement, safety and time saving. Fast and smooth, it's easy on the operator.

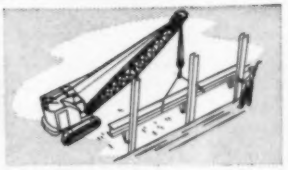
Speed-o-Matic full hydraulic controls mean stepped-up production

Speed-o-Matic Controls — fully hydraulic! You "feel" the load all the way. Simple, easy—fingers instead of muscles do work.

Eliminates up to 150 parts — cuts friction, no worn bushings, pins, links or clutch toggles to put you "down."



Up to 25% more production — fast operating cycle steps up output and profits. Effortless control keeps operator fatigue down.

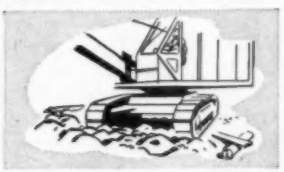


Pinpoint Accuracy — eliminates lost motion. Instant hydraulic response assures spotting heaviest loads—easily, precisely.

Here are other LINK-BELT SPEEDER plus features that work for you

All-Welded Stress-Relieved Construction — extra strength without extra weight. Resists impact, twist. Field service simple.

Convertibility — designed for peak production as shovel, crane, dragline or trench hoe. Convert in field—quickly, easily.



High Ground Clearance — eliminates snagging or fouling in rough areas. No projecting castings or easily damaged parts.

Service — fast, efficient. Link-Belt Speeder Service is nationwide—near you with replacement parts, factory-trained mechanics.

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phate mill constructed by Elk Falls Co., Ltd., on Vancouver Island. Eight companies have launched a co-operative three-year research project on chemical debarking of certain western pulpwood species. Prof. D. J. Worr, University of British Columbia, is in charge of this investigation.

Technical Sessions

A method permitting the *determination and control of printing quality of newsprint* as it flows from the paper-making machines was described by Alex. Glassman of St. Lawrence Paper Mills Co., Ltd. Strips of paper, collected from the reels of newsprint, are printed with standard ink and analyzed. Whenever the paper shows defects in quality, such as excessive blackness or through-printing, the process can be checked immediately to determine the cause of the defect. This testing technique permits rapid and quantitative evaluation of the effect any introduced changes in the manufacture of newsprint may have on the printing quality of paper. Any defects in printability usually can be corrected on the spot before the newsprint is shipped.

The performance of refining and beating machines used in preparing pulp-stock was evaluated by H. D. Hyman, Alexander Fleck Ltd., and H. P. Espermiller of the Black-Clawson, Shartle, Dilts, Laboratories. Preparation of pulp stock involves treatment of the cellulose fibers so that they may be properly felted into paper on the paper-making machine. The width between the bars on the beater is an important factor determining the felting properties of fiber produced.

The removal of dirt from unbleached sulphite pulp, where dirty and knotty wood is used, remains an unsolved problem, according to J. Foster, Gaspesia Sulphite Co., Ltd. The four dirt-removal methods now in use are based on rotary screening, flat screening, centrifugal action and refining action. Mr. Foster described the equipment involved in each method and pointed out their advantages and limitations. Since none of these methods removes the fine specks of dirt, Mr. Foster suggested that in localities where small knotty wood prevails the best solution might be conversion of the unbleached process to one of bleached pulp.

The properties and uses of *diatomaceous earth filters in the filtration of boiler feed-water* were discussed by T. H. Norris of Abitibi Power & Paper Company Ltd. These filters are used where extreme clarification and rapid filtration are desired. The cost of operation of a diatomaceous earth filter, said Mr. Norris, is very small. Such filters permit reclaiming of contaminated condensate which has hitherto been wasted.

Some aspects of *automatic consistency control of pulp stock* based on viscosity were clarified in a paper by R. Murley, Bowater's Newfoundland Pulp & Paper Mills Ltd., who received honorable mention for this paper in the 1952 C. Howard Smith Medal Award competition sponsored by the Technical Section. Manual control and frequent testing are impracticable for accurate control, according to Mr. Murley, because the operator cannot judge consistency within the required limits, nor can tests be performed quickly and accurately enough to enable the operator to make the necessary water adjustments in the stock.

A method of analyzing sulphate black liquor was described by G. G. Sutaone, who is temporarily with Canada Paper Co. He particularly recommended the use of the Parr peroxide bomb as a rapid means for determining total carbon and sulphur in the sulphate black liquor. The method gives reproducible results and is sufficiently accurate for routine control and mill investigation work, he said.

K. G. Trobeck, Aktiebolaget BT-Metader, Sweden, described equipment and investigations that had led to a tremendous *reduction of sulphur losses* during the evaporation of black liquor, if the liquor is oxidized prior to concentration. In the conventional process, sulphur losses are as high as 24-36 pounds per short ton of pulp.

Possibilities of extracting and utilizing coniferous oils from logging slash, branches and foliage — amounting to about 20 per cent of the tree's weight— were discussed by A. C. Shaw, Ontario Research Foundation. Hemlock, black spruce, white cedar and balsam fir yielded appreciable quantities of oils of commercial value and of good to excellent odor. Although all oils contain bornyl acetate, it appears in important quantity in spruce and hemlock only. The most valuable constituent of cedar oil is thujome.

D. W. Stranks, Ottawa Forest Products Laboratories, discussed *possibilities of converting waste wood by fermentation* into useful products. He disclosed some results obtained at the Ottawa laboratories using rumen organisms for the fermentation of wood waste. Experiments showed that, when rumen fluid was used to ferment filter paper, cellulose was decomposed very rapidly, resulting in the production of butyric, propionic, and acetic acids. Since, due to the accumulation of these acids, the fermentation of only 1 per cent cellulose suspensions can be brought to completion, it will be necessary to devise some simple technique of removing the acids as they are formed, Mr. Stranks said. He indicated two possibilities of approach to the problem of wood waste utilization: (1) straightforward fermentation or (2) conversion of waste wood into some form of cattle fodder and letting the rumen organisms complete the fermentation in the animal.

Methods of testing the strength of the wet web of paper were outlined by E. Langins, Bowater's Newfoundland Pulp & Paper Mills Ltd. These tests are important since the speed of the paper machine must be adjusted to the strength of the wet web of paper, which moves unsupported to the first press and carries water weighing five times the quantity of actual fiber in it.

Faced with the necessity of *expanding its lime-recovery capacity,* commensurate with an increased output of kraft pulp, Chesapeake Corp. of Virginia decided to install flash-drying equipment instead of a costly additional kiln. This was disclosed in a paper by Henry Vranian and R. D. Nickerson. The process, which is said to remove moisture from materials practically instantaneously by the application of heat in a turbulent stream of hot air, has increased the company's capacity of lime-recovery and reduced fuel consumption appreciably, said Mr. Vranian.

D. D. Hall, the E. B. Eddy Co., presented the *report of the materials handling committee.* The report was a compilation of case histories of improved methods for common basic handling operations such as pulp removal from the machine; transportation of sheets of pulp between pulp mill and paper mill, and pulp storage. The committee had also established a standard of comparison to permit the determination of the most efficient methods in materials handling.

Reviewing the pulp handling operations at a number of mills, Mr. Hall described in more detail the installations at MacMillan & Bloedel Ltd., Nanaimo, B.C., especially the company's latest equipment used for piling, pressing and baling sheets of pulp. Also of interest were the overhead electric cranes used by the Quebec North Shore Paper Co., to transport bales of pulp to storage.

Various types of controls, including the master governor, individual governors, and control stands, were described by Duncan Graham, Abitibi Power & Paper Co., Ltd. He outlined the operation and maintenance of regulators governing the electrical load on grinders and emphasized the necessity of all controls working smoothly together to maintain maximum output of pulp at minimum power load.

Under its long-range modernization program, *Powell River Co., Ltd., plans to increase its daily output* by an additional 120 tons of groundwood through the installation of two modern high-speed grinders, said S. A. Collicut, the company's superintendent for technical

services. These grinders will be designed to permit semi-automatic feeding, without jamming, of 64-inch long blocks that are predominantly rectangular.

Other papers presented at the meeting dealt with groundwood thickening methods by E. P. Walsh, Anglo-Newfoundland Development Co., Ltd.; experimental cooking of high-yield sulphite pulp by W. H. Bush, O. J. Walker and K. C. Logan, Northeastern Paper Products Ltd.; switching equipment, by J. P. Skillen, Canadian Westinghouse Co., Ltd.; tearing strength of paper by H. W. Jones and W. Gallay, E. B. Eddy Co., and winder drives by L. W. Fisher, Canadian General Electric Co.

Presentation of Awards

Douglas W. Ambridge, president of Abitibi Power & Paper Co., Ltd., received a special medal award and citation in recognition of the many benefits the Canadian pulp and paper industry derived during his tenure of office as chairman of the Association's executive board.

The I. H. Weldon Gold Medal was awarded to *Dr. G. L. Laroque,* of the *New York Daily News,* for his paper dealing with measuring printing ink quality, which was presented at the 1951 meeting of the technical section.

J. C. Benny, Diamond Match Co., who has been chairman of the section's Sulphite Committee for two years, received the Technical Section Service Award. The Sulphite Committee's report on methods of conserving sulphur has saved the pulp and paper industry an estimated 22,000 tons of sulphur during the year.

The Howard Smith Gold Medal went to *G. G. Sutaone* for his paper on the analysis of cooking liquor used in the manufacture of pulp. Mr. Sutaone is temporarily with the Canada Paper Co., where he is studying Canadian pulp and paper processes. He intends to return to his native India to apply his knowledge gained in the Canadian industry.

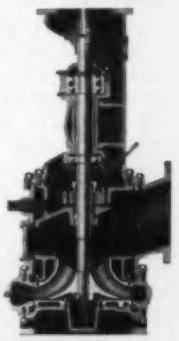
Winner of Class A Award in the safest mill in Canada contest for mills showing over 50,000 man-hours a month, was *the Grand 'Mere Que., mill of Consolidated Paper Corp. Barrett Co., Ltd.,* was the winner of Class B Award for mills showing less than 50,000 man-hours a month.

First prize in the gadget competition went to *E. A. Shields* of Provincial Paper Ltd., for his device that improves the winding of finished rolls of paper and therefore permits a higher machine speed. *J. C. Cowie* of Mersey Paper Co., Ltd., won the second prize for his invention that keeps the paper from wrapping around the last dryer of the paper-making machine whenever a break in the paper occurs.

You save space with this vertical Goulds STOCK PUMP

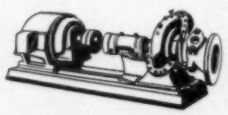
Where space is at a premium, you'll find the Goulds Fig. 3115 the ideal pump for paper stock transfer. Because of its vertical design, it requires a minimum amount of floor space.

Simple, durable construction assures long service life and easy maintenance. Its readily accessible rotating element can easily be removed without disturbing suction or discharge connections. Large, direct passages permit free flow of heavy stock—eliminate air-binding. Ample flushing and drain connections, both in casing volute and in base, provide easy cleaning. This pump is available with capacities up to 2000 G.P.M. Heads up to 180 ft. Complete information is contained in Bulletin 723.2. Send for it today.

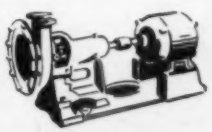


GOULDS Fig. 3115
Backwall ejector vanes on impeller prevent binding of stock behind the impeller . . . also give hydraulic thrust balance.

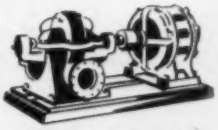
Other Dependable GOULDS Pumps for the Paper Industry



GOULDS Fig. 3105
Heavy duty, open impeller horizontal centrifugal pumps designed for handling paper stocks. Capacities up to 4000 G.P.M. Heads up to 220 ft. Send for Bulletin 723.1.



GOULDS Fig. 3705
Stainless steel pumps for handling acid and alkaline liquors. Capacities up to 600 G.P.M. Heads up to 160 ft.



GOULDS Fig. 3450
These double-suction, single-stage Goulds centrifugals will handle up to 15,000 G.P.M. Heads up to 500 ft. Ask for Bulletin 721.2.

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U. of Maine Foundation Honors George D. Bearce

George D. Bearce of Bucksport, Maine, has received the 1952 Honor Award presented by the University of Maine Pulp and Paper Foundation. The award, made "in recognition of outstanding service to the pulp and paper industry in management and technology," was given Mr. Bearce during the annual luncheon meeting of the university's Pulp and Paper Alumni at the Biltmore Hotel, New York, N. Y., February 19. The luncheon is always held during the week of the national TAPPI and APPA conventions.

Mr. Bearce, general manager of St. Regis Paper Co. operations in Maine, received the honor in a presentation made by J. L. Ober, vice president of Scott Paper Co., Chester, Pa., who is chairman of the Foundation's executive committee. Chairman of the meeting was Robert Ramsdell of the Paper Makers Chemicals Div., Hercules Powder Co. Also on the program was Lyle Jenness, head of the university's chemical engineering department.

Established about two years ago, the Foundation is designed to interest students in the university's pulp and paper program, to provide loans and scholarships for these students, to interest students and men from industry in advanced study, to screen outstanding students for the five-year operational management program, to augment the teaching staff, and to advance fundamental and applied research.

Mr. Bearce, recipient of this year's Honor Award, is a native of Auburn, Maine, where he was graduated from Edward Little High School. A member of the class of 1911 at the University of Maine, he was prominent in athletics, winning varsity letters in football, baseball, and track. He was elected to membership in the Sophomore Owls and Senior Skulls, both student honor societies. He has been particularly active in alumni affairs. He has also done graduate work at Columbia University and Harvard Law School.

After receiving his B.S. degree from Maine, Mr. Bearce entered a long career in the paper industry. For several years he was with Mead Corp., Chillicothe, Ohio, and later he served for seven years as an engineer with the Newsprint Service Bureau. Later he became manager of the Dalhousie (Canada) mill of International Paper Co. He was a pulp and paper mill consultant in New York for a time. In 1935 he was named general manager of the Maine Seaboard Paper Co. mill at Bucksport and was named vice president in 1945. The Bucksport mill was acquired by St. Regis in 1946. Mr. Bearce is a member of the Technical Association of the Pulp and Paper Industry and a member of the American Society of Mechanical Engineers.

The recipient of the Foundation's first Honor Award last year was Dr. Ralph H. McKee, of New York. Dr. McKee was honored for having started the first college course in pulp and paper technology in the country at the University of Maine in 1913.

Aniline Printing in Carton Industry Discussed at Chicago TAPPI

The uses of aniline printing in package printing and its entry into the folding carton field were described and evaluated in a talk by Frank A. Dick at the February 11th meeting of Chicago TAPPI. Mr. Dick, who is assistant to the executive vice president of International Corp., Printing Ink Div. (IPI), Chicago, prefaced his talk with a brief history of aniline printing.

Aniline printing is today a misnomer, since aniline dyes are no longer used in making the inks employed in this quick-drying, rotary rubber-plate process. Composition of 80 per cent of modern "aniline" ink is pigment, ethyl-alcohol solvent and a suitable resin. Mr. Dick said that the advent of Buna-N synthetic rubber has greatly increased the number of solvents which may be used in aniline printing. (Alcohol still is the principal solvent, although regular pigments used in oil inks have replaced aniline dyes in aniline-type inks.) Water-base inks are used for some types of printing but in general do not produce the best quality work.

Result Obtained Quickly

One of the special advantages of aniline printing is that the result can be seen almost immediately after the impression is made by the press, since there is virtually no waiting for ink to dry or set. Drying action of solvent-type aniline inks is by evaporation, while oil-base inks dry by oxidation; therefore, when running porous stock, aniline needs no special drying equipment, even at high speeds. However, plastic film and other hard-surface stocks often require dryers. Another advantage of aniline ink described by Mr. Dick is that it is virtually odorless upon drying.

ANILINE PRINTING was discussed at the February Chicago TAPPI meeting by Frank A. Dick; to his right is V. V. Vallandigham, chairman of the Chicago section

Sizes of aniline presses now in use, according to Mr. Dick, vary from one-inch-wide tape-printing devices to a press that prints a 130-inch web. As an indication of practical printing speeds attainable on an aniline press, he remarked that one 118-inch aniline press now in use runs at speeds up to 1,600 feet per minute.

Because plate cylinders may be quickly changed and the fountain, fountain roller and transfer roller assembly of most aniline presses may be moved forward or back to accommodate smaller or larger plate cylinders, aniline printing lends itself to speedy, economical changes in cut-off lengths of the web.

Installation Cost Low

Mr. Dick pointed out that the original installation cost of an aniline-printing, in-line-die-cutting-carton-combination is only about one-third to one-half that of the necessary sheet-fed letterpress equipment.

In addition to presses now being manufactured for printing carton board or for general printing of paper, Mr. Dick cited an aniline printing device which may be built into a roller conveyor so that filled corrugated shipping containers may be printed on four or five sides in the container-user's plant. One company claimed that it had reduced its container inventory to one-sixth of the quantity of printed containers formerly kept on hand. Only relatively simple printing is handled by the process to date, however.

A disadvantage of aniline printing of folding cartons is that there "is no real chance of obtaining a semi or full gloss with present inks," Mr. Dick said. He pointed out, however, the ease with which a full gloss is obtained with a coat of varnish, which, in the aniline process, is applied in the same operation

as is the printing, at a definitely lower cost than letterpress or other varnishing methods.

At present, the handicaps of the aniline process are those of the rubber printing plate. In general, present screen work on aniline is done with 65 or 80 lines per inch.

Coming Events

TAPPI meetings

May 5-8—Third Coating Conference, Sherman Hotel, Chicago.

American Pulp and Paper Mill Superintendents Association meetings

March 20—Michigan Division, Hotel Harris, Kalamazoo.

March 21—Miami Valley Division, Cincinnati Chemical Works, Cincinnati.

April 17—Michigan Division (joint meeting with Kalamazoo Valley Section of TAPPI), Hotel Harris, Kalamazoo.

April 24—Miami Valley Division, Manchester Hotel, Middletown, Ohio.

May—Miami Valley Division, Orr Felt & Blanket Co., Piqua, Ohio.

May 9-10 — Northwestern Division, Rockford, Ill.

May 9-10—Pennsylvania-New Jersey-Delaware Division, Yorktowne Hotel, York, Pa.

June 17-19—National meeting, Book-Cadillac Hotel, Detroit, Mich.

Other meetings

March 24-26—National Paper Trade Association, annual meeting, Waldorf-Astoria Hotel, New York, N.Y.

March 24-27—American Chemical Society, national meeting (Buffalo section), Statler Hotel, Buffalo.

March 26-28—Woodlands Section, Canadian Pulp & Paper Association, annual meeting, Mount Royal Hotel, Montreal.

March 30-31 — Packaging Machinery Manufacturers Institute, semi-annual meeting, Hotel Dennis, Atlantic City, N.J.

March 31-April 3—American Chemical Society, national meeting (Milwaukee section), Hotel Schroeder, Milwaukee.

April 1-4—21st National Packaging Exposition, Atlantic City Auditorium, Atlantic City, N.J.

April 29-30—Metal Powder Association, show and Eighth Annual Meeting, Drake Hotel, Chicago.

May 11-14 — American Institute of Chemical Engineers, French Lick Springs Hotel, French Lick, Ind.

May 15-16—Institute of Paper Chemistry, Sixteenth Annual Executives' Conference, the Institute, Appleton, Wis.

June 23-25—Forest Products Research Society, national meeting, Milwaukee.

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Every felt is a compromise. If strength is your first requirement, your felt must be woven of tough but soft woolen yarn. For speed, the spaces between the strands of yarn must be large enough to let the water run through as fast as the press can squeeze it out. For fine finish, the face of the felt next to the sheet should be amply napped for cushion.

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The Paper Industry Names in the News

Three Named to Syracuse Research Staff

Three men have been appointed to the professional staff of the Department of Pulp and Paper Manufacture at the State University College of Forestry, Syracuse, N. Y. The announcement was made by Dean Joseph S. Illick, who noted that the combined faculty and research staff at the school now totals 99.

DONALD W. LIBBY of Orono, Me., has been named research associate and project leader on the college's hardwood pulping project that has resulted in development of the "chemigroundwood" process. He succeeds *PAUL M. SCHAFFRATH*, who resigned to join Oxford Paper Co. in Rumford, Me.

HAROLD HICKSON of Bangor, Me., appointed technical assistant, will also work on the pulping project, which is sponsored by a group of industries organized as Empire State Paper Research Associates, Inc.

DANIEL V. LENT of Auburn has been made an instructor in the Department of Pulp and Paper Manufacture. During the 1950-51 school year he was assistant professor in chemistry at Western Michigan College, Kalamazoo.

JOHN J. INCH has been appointed to the newly created position of traffic assistant to the vice president in charge of distribution for Scott Paper Co., Chester, Pa. He joined the firm in 1909 as a traffic clerk and was made traffic manager in 1918. He has been assistant director of traffic since 1950. Succeeding Mr. Inch is *O. H. MILLER*.

A. J. SCHIERL, general manager of Whiting-Plover Paper Co., Stevens Point, Wis., will leave the firm March 1. Succeeding him as general manager will be *THOMAS LEECH*, presently vice president and sales manager. Mr. Schierl, with the firm since 1916, has been general manager since 1948.

Stockholders of Lee Paper Co., Vicksburg, Mich., returned all directors to the board at the annual meeting January 25. Directors are *R. D. NUGENT, SAMUEL S. HOLMES, MAXWELL D. BARDEEN, BYRON BISHOP, W. J. COMSTOCK, MERRILL W. TAYLOR, WOODBURY RANSON*, and *JOHN C. HOWARD*. Officers reelected by the directors include Mr. Bardeen, president and general manager; Mr. Nugent, first vice president; *NORMAN BARDEEN*, vice president in charge of sales; Mr. Bishop, secretary, and Mr. Comstock, treasurer.

JULIAN MENDELSON was recently made sales manager of the multi-wall sack division of Hudson Pulp & Paper Corp.

IRVING C. BARNES has been appointed controller of Strathmore Paper Co., West Springfield, Mass. He succeeds Paul A. Wilks, who was recently elected treasurer. Mr. Barnes joined the firm's cost department in 1920; he was made chief accountant in 1946.

ROBERT TIFT, Dougherty (Ga.) County forester for the past 16 months, has been made assistant forester in charge of management for the Eighth District, with headquarters at Waycross. Succeeding Mr. Tift is Wallace Binns.

C. W. Lillie

J. R. Dam

Allied Paper Mills, Kalamazoo, Mich., has announced the promotions of three members of the technical staff. The three are as follows: *CHARLES W. LILLIE*, acting superintendent, to superintendent of manufacturing and development in the photographic division; *JOHN R. DAM* from chemist to chief chemist, and *H. RAY HALL* from research associate to assistant technical director.

CLAYTON CARL has been appointed superintendent of the West Point, Miss., works of Babcock & Wilcox Co. A. P. Cramp, company plant engineer, who came to West Point last summer to direct construction of the new plant, will remain in charge of that operation until its completion.

CHARLES WINKELMAN has been appointed to the newly created position of director of industrial engineering at Gardner Board & Carton Co., Middletown, Ohio. Before joining Gardner he was supervisor of the industrial engineering program at Belden Mfg. Co., Richmond, Ind.

R. A. McDONALD, executive vice president of Crown Zellerbach Corp., San Francisco, has been named assistant administrator of the National Production Authority. He is to be in charge of the Industrial and Agricultural Equipment Bureau.

R. S. HATCH has assumed the task of organizing a research department for Hudson Pulp & Paper Corp. at Palatka, Fla. He will remain with the firm until the new organization is operating smoothly. Until someone in the firm is chosen as director of research, Mr. Hatch will serve in that capacity.

H. R. Hall

C. R. Georg

CURTIS R. GEORG has been elected a vice president and director of Graham Paper Co., St. Louis. He has been associated with the firm since 1934, becoming eastern divisional manager in 1940. Mr. Georg is to be in charge of coarse paper operations in St. Louis and 24 divisions. Succeeding him in the East is *PHILIP MILES*.

Scott Paper Co. has announced the appointment of *J. D. BOWDEN*, sales personnel manager, as assistant to the vice president in charge of distribution. *J. B. KIRKPATRICK* has been made New England divisional manager with headquarters in Boston, and *L. H. WRIGHT* has been named sales personnel manager in Chester, Pa. Mr. Bowden has been with Scott since 1937 and has

served as assistant to the national retail sales manager and sales personnel manager.

SAMUEL KIPNIS, president of National Container Corp., has accepted the over-all chairmanship of the Paper Division in the current polio appeal of the National Foundation for Infantile Paralysis in Greater New York.

Kimberly-Clark Corp., Neenah, Wis., has appointed two vice presidents and two assistant vice presidents. They are *W. R. KELLETT*, vice president in charge of manufacturing; *R. W. LYONS*, vice president in charge of the woodlands department; *F. S. SEABORNE*, assistant vice president and general superintendent, and *W. H. SWANSON*, assistant vice president and director of research and development.

HERBERT W. ANGELL, for the past 13 years a member of the technical staff of American Lumber & Treating Co., Chicago, has been made technical director of the firm.

JOHN B. ASTELL has been made chairman of the board of John B. Astell & Co., Inc., New York, N.Y., distributors of piping and tubing. *H. L. BIALOCK*, manager of sales for the Tubing Specialties Div. of National Tube Co., has been elected president. *FRANK J. HEINZMANN* has been appointed vice president and *EDWARD J. MOGOL* secretary.

C. H. Kent

H. L. Mellen

Hercules Powder Co.'s Paper Makers Chemical Department at Holyoke, Mass., has announced two changes in administrative sales personnel. *C. H. KENT*, district manager, assumes the duties of special sales representative in New York and New England. He was one of the founders and the first secretary of the Connecticut Valley Div. of the Superintendents Association. *HENRY L. MELLEN*, assistant manager since 1946, has been made district manager. Before joining the firm he was chief chemist and purchasing agent for Deerfield Glassine Co., Monroe Bridge, Mass.

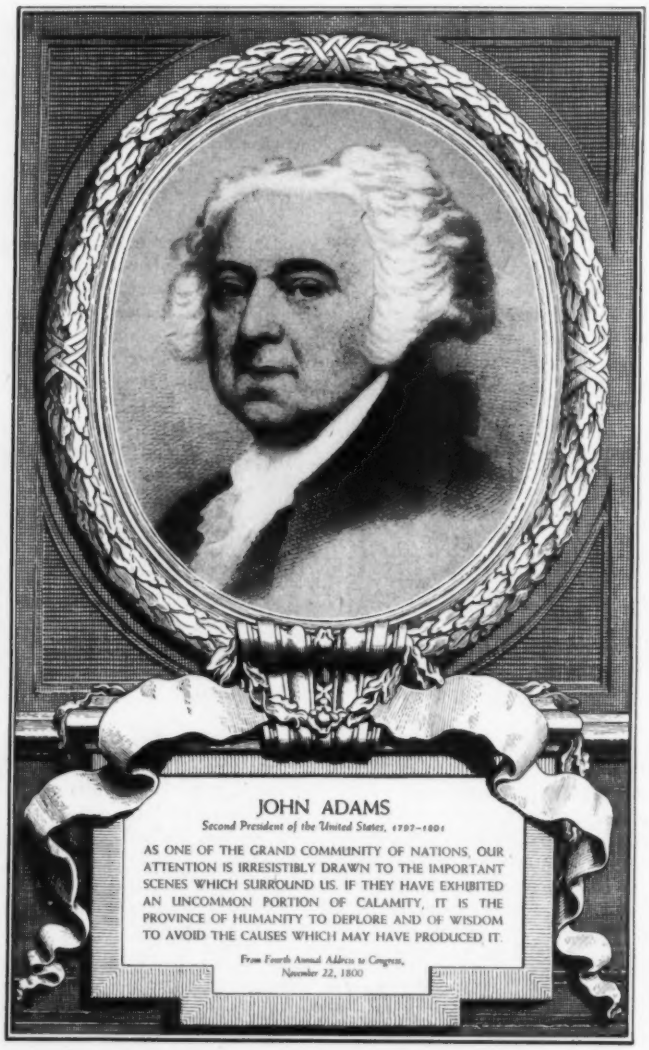
HAROLD HOLMES, head of technical sales service for Hammermill Paper Co., Erie, Pa., celebrated a quarter century of service with the firm December 1.

JAMES BATTERSBY, sales manager for Masson-Scott, British cutter and layboy manufacturer, arrived in the United States recently on a world tour of M-S installations. He visited West Coast mills with *JOHN ROSLUND*, Downingtown Mfg. Co. western representative, and *JAMES THORNTON*, Downingtown sales engineer.

RICHARD H. EMERSON JR. has been named northern division sales manager in the Building Materials Division of Bird & Son, Inc. He replaces Miles Hubbard, who resigned recently. Mr. Emerson joined the firm as a sales correspondent in 1933.

H. D. WARNER, chairman of the board of Gulf States Paper Corp., has celebrated his 35th anniversary with the firm. He received a 35-year service pin and a gold wrist watch at a party given in his honor.

JOSEPH J. HORAK has been put in charge of the southeastern states for Fuchs & Lang Mfg. Co., division of Sun Chemical Corp. For the past five years


JOHN ADAMS
Second President of the United States, 1797–1801
AS ONE OF THE GRAND COMMUNITY OF NATIONS, OUR ATTENTION IS IRRESISTIBLY DRAWN TO THE IMPORTANT SCENES WHICH SURROUND US. IF THEY HAVE EXHIBITED AN UNCOMMON PORTION OF CALAMITY, IT IS THE PROVINCE OF HUMANITY TO DEPLORE AND OF WISDOM TO AVOID THE CAUSES WHICH MAY HAVE PRODUCED IT.
From Fourth Annual Address to Congress, November 22, 1800

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of pressure roll in Rice Barton Paper Machine Dryers

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In Rice Barton "Yankee-type" paper machine dryers like the one shown, it is extremely important that both ends of the pressure roll are raised at exactly the same rate so they will contact the drying cylinder simultaneously.

To assure such precise control, Rice Barton incorporates a Ross Type BCF Exchanger in the hydraulic circuit. With this provision, excessive oil temperatures and resulting viscosity changes *are prevented* . . . conditions that would otherwise develop during the "dead end" or "holding service" (while the pressure roll is being held against the face of the dryer). Clearly, without this oil-cooling security, consistent repetition of operations would be seriously hampered.

This is but one of the many instances in which Rice Barton uses Ross Type BCF Exchangers to assure constant, peak capacity in hydraulic applications . . . but one of the numerous instances where Ross Exchangers are serving other types of paper and pulp machinery.

To be acquainted with the full advantages of this completely standardized, pre-engineered, copper and copper alloy unit, request Ross Bulletin 1.1K5.

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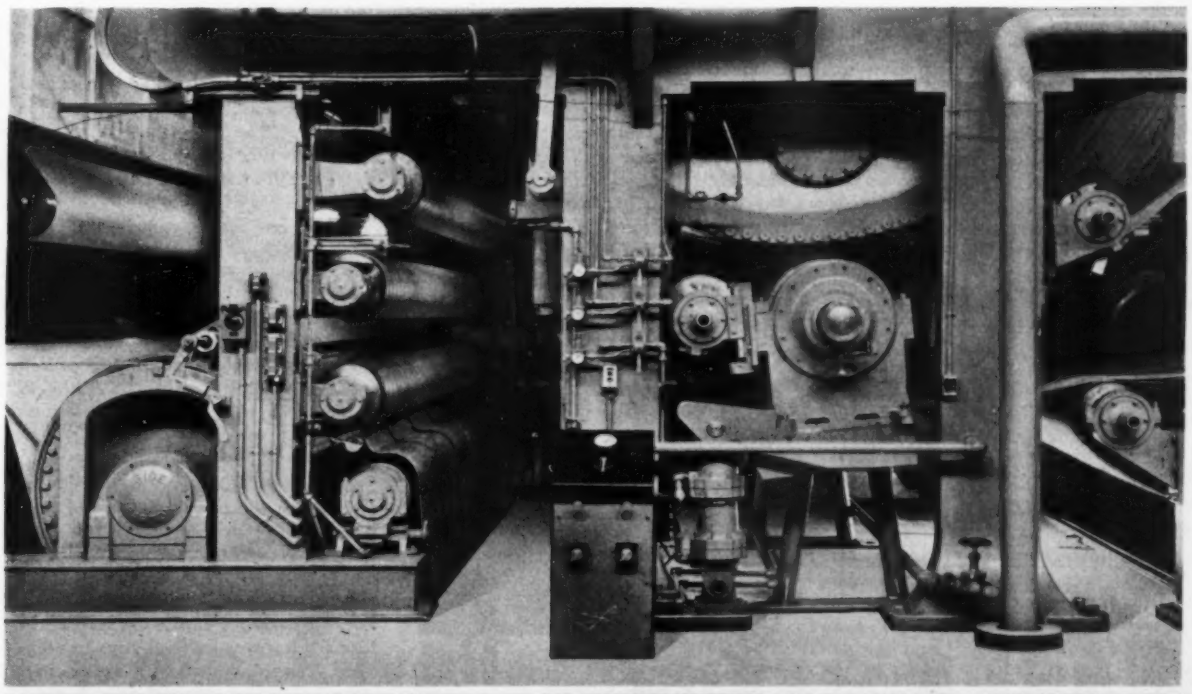

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These compact units automatically **count** and **mark** sheets being stacked at the delivery end of printing presses and other paper processing equipment. Absolute accuracy is assured—costly hand counting and errors are eliminated. Learn what this complete line offers you:

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COUNTER & CONTROL CORPORATION

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he was in charge of the Fuchs & Lang Philadelphia office.

Naugatuck Chemical Div. of United States Rubber Co. has announced four organizational changes. *DR. C. D. McCLEARY,* formerly manager of process development, has been named manager of basic research. *DR. J. N. JUDY,* formerly manager of technical service laboratories, will succeed Dr. McCleary. Succeeding Dr. Judy is *C. G. DURBIN.* At the same time, *IVAN MANKOWICH* was named manager of reclaim development.

Cowles Co., Inc., Cayuga, N. Y., recently elected eight directors, as follows: *EDWIN COWLES, ARTHUR W. INFANGER, EDWARD S. ROGERS III, HORTON N. MEYER JR., RANDOLPH H. SEYMOUR, ROBERT P. HUNTLEY, JOSEPH P. ROGERS,* and *CHARLES A. WINDING.* Company directors chose the following officers: Mr. Cowles, president; Mr. Infanger, vice president and chief engineer; Mr. Meyer, vice president and sales manager, and Mr. Edward Rogers, secretary-treasurer.

Spitzer Paper Box Co., Toledo, has announced the appointment of *MILTON A. RIDEOUT* as sales manager. He has been with the firm 20 years. *PHILIP D. SCHIESSER* has been named superintendent of the firm's set-up box department and placed in charge of labor relations.

JAMES A. MAROHN of New York, N. Y., was recently elected vice president of Kalamazoo Vegetable Parchment Co. in charge of corporate finances. He was formerly vice president and treasurer of Noma Electric Corp. *E. NORVAL HUNTER,* vice president of KVP in charge of Canadian operations, was elected to the firm's board of directors to fill the vacancy caused by the recent death of Joseph B. Kindleberger.

J. A. Marohn

C. E. Duerr

C. EDWARD DUERR has recently been appointed assistant sales manager of the paper bag machinery and printing press division of Potdevin Machine Co., Brooklyn, N.Y. He has been associated with the paper converting and printing press industry for more than 20 years.

JAMES N. SIMONS has been named New York State sales representative for Continental Can Co's Paper Container Div. He will cover the state, exclusive of New York City, and parts of Pennsylvania.

Continental Paper Co., Ridgefield Park, N.J., has announced several changes in the purchasing department. *DONALD R. AYERS,* with the firm for more than 20 years, will handle all purchasing. He is to be assisted by *MISS LORRAINE R. ANZALONE. MELVIN A. DuBOIS* will continue as assistant agent.

New York Belting & Packing Co. has announced the appointments of two new district sales managers and three new factory representatives. *CARL G. LINK JR.,* formerly Chicago representative, has been named northern district sales manager; *WILLIAM I. BUTLER,* formerly factory representative in Memphis, Tenn., was named southeastern district sales manager; *FRANK E. CAVANAUGH* has been added to Mr. Link's staff as a factory representative in Mem-

LAYNE PUMPS

for decatur, alabama

Nine Layne river intake and filtered water pumps have been installed to quadruple Decatur, Alabama's city water supply. Four of these short coupled vertical turbine pumps have a combined capacity of 4-million gallons of filtered water daily.

These self priming, space saving pumps are Layne designed and precision built to maintain peak operating efficiency. They are constructed of materials selected for durability and are rugged enough to give excellent service for the years to come.

Like the city of Decatur, a great number of other municipalities, factories, processing plants and chemical works have found Layne pumps to be exactly as described. All are engineered for the job they are to do . . . and all more than fulfill their performance obligations. For further information address

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

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water wells
VERTICAL TURBINE PUMPS
WATER TREATMENT

Extend Titanium Save Pulp

by using DICALITE BP-5 PAPER-AID

Dicalite diatomaceous paper-aids have been used in a large number of paper mills in the last 10 years. Under both war and after-war conditions use of these materials has returned dollar profit besides production improvements. Under today's conditions of higher prices and shortages of certain materials, Dicalite is even more valuable as a paper-making aid.

SAVE TITANIUM DIOXIDE—It is often possible to cut TiO_2 consumption from 10 to 20% (depending on the finished product and mill operating conditions) and still maintain required brightness and opacity when Dicalite is used. Dicalite has a two-way action in the furnish that both "extends" or increases the opacifying and brightening power of the titanium and increases retention of the TiO_2 pigment.

SAVE PULP—Dicalite directly replaces a portion of bleached sulphite pulp at a considerable saving, because of its great bulk and high retention. It will economically replace even cheap fibers in sheets with a weight of 50 lbs. per cubic foot or less. In addition, formation is improved and other operating benefits secured.

DICALITE BP-5 is a high quality high brightness natural material, widely used as a paper-aid. Write or phone our nearest office and a Dicalite engineer will gladly give you further details and supply samples for tests.

DICALITE DIVISION, GREAT LAKES CARBON CORPORATION

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DICALITE
PAPER-AIDS FOR BETTER PAPER PRODUCTS

phis, Tenn.; *JOSEPH VAN SCHAIK*, formerly with the home office in Passaic, N. J., has been named factory representative at Denver, and *WAYNE E. LAW*, formerly in the Houston office, has been appointed oil field factory representative in the Rocky Mountain states.

LOUIS S. KIMBALL has been named president of the recently reestablished Angier Sales Corp. The new corporation will be responsible for the sales of all products of Angier Corp., Framingham, Mass., for many years manufacturer of industrial packaging and building papers. He is also a vice president and director of the manufacturing firm.

PETER J. ABEL became associated with the sales engineering staff of Sandy Hill Iron & Brass Works, Hudson Falls, N. Y., in December after having been with Stickle Steam Specialties Co., Indianapolis, since 1926. He will continue to represent Stickle in the field of paper mill condensate evacuation systems and control systems.

West Coast representative, has been appointed general sales manager. *JAMES L. COSTIGAN*, assistant sales manager, has been named sales manager. *SIDNEY F. GREENWOOD* succeeds Mr. Costigan as assistant sales manager, while *ROBERT L. NISSEN* has been employed as advertising and promotion manager.

N. J. NIKS, general superintendent of Munising Paper Co., has been appointed by Michigan's governor G. Mennen Williams to the board of managers of the Upper Peninsula Fair.

HERMAN H. MILLER, one of the country's leading compressor authorities, retired recently after serving 50 years with Worthington Pump & Machinery Corp., Harrison, N.J. In 1911 he became manager of the air compressor department at the New York offices and in 1915 became sales manager of the Cincinnati plant. In 1932 he was made manager of the Compressor Division, when the Cincinnati plant was consolidated with the Buffalo plant.

F. S. ELFRED and *B. E. BASSETT* have been named executive vice president and vice president for production respectively of Olin Industries, Inc.

GUY M. MINARD, plant manager at Kapuskasing, Ont., and *R. J. APPERT*, head of the Spruce Falls service department in New York, have been named vice presidents of Spruce Falls Power & Paper Co., Ltd.

LOUIS CALDER JR., vice president, assistant to the president and a director of Perkins-Goodwin Co., New York, N. Y., has assumed the duties as sales manager of the paper department. The post was formerly held by David I. Edwards, who has retired because of ill health.

Rice Barton Corp., Worcester, Mass., has announced the appointment of *ANGUS J. GARDINER* as assistant vice president in charge of sales. He was formerly associated with International Paper Co. and for many years was with Great Northern Paper Co.

P. J. Abel

Charles Melidosian

H. H. Miller

J. A. Borman

A. J. Gardiner

J. C. Barthal

CHARLES MELIDOSIAN has been made sales representative for E. P. Lawson Co. in Michigan and northern Ohio. The appointment is part of a program aimed at the expansion of Lawson's Midwest sales staff. Although Mr. Melidosian will be working out of the Chicago office, he will make his headquarters in Detroit.

M. NIELSEN has been appointed assistant vice president of Babcock & Wilcox Co., New York, N. Y. He will assist the vice president in charge of manufacturing in the operations of all the firm's plants in the boiler division. He joined Babcock & Wilcox in 1924 in the erection department at Chicago.

PAUL K. CARTIER has been made assistant secretary of Champion Paper & Fibre Co., with responsibilities in the firm's Hamilton (Ohio) Division. He joined the organization in 1905.

Tri-Clover Machine Co. has announced organizational changes in the firm's sales department. *TODD LaROSE*, who has been the company's

JOHN A. BORMAN has been made chief engineer for Baker-Raulang Co., Cleveland. He will have charge of the administration of the engineering department, both with regard to new development work and production engineering.

MASON T. ROGERS, who retired recently as packaging and merchandising director of Dewey & Almy Chemical Co., has announced that he is opening a general merchandising consulting office. He is a past president of the Packaging Institute.

WILLIAM S. PATTON has been promoted to assistant district sales manager for the eastern territory of Hammermill Paper Co. For the past year he has been district sales representative in the east, working out of New York, N. Y.

WILLIAM L. SMITH of Montreal has been appointed offices services manager for the Pulp and Paper Research Institute of Canada. He had previously been office manager of the Canadian Chamber of Commerce.

J. C. BARTHAL has been placed in charge of new products development in the Paper Chemicals Department of American Cyanamid Co. He was formerly senior chemical engineer at the firm's Stamford Research Laboratories in Stamford, Conn. Before joining Cyanamid he was on the staff of the Institute of Paper Chemistry, Appleton, Wis.

A. LEE GORDON JR. has been appointed manager of the Memphis-Mid South territory of National Container Corp. Mr. Gordon, who has many years experience in the shipping container industry in the South, will open a regional office in Memphis.

Gair Co. (Canada) Ltd., Toronto, has announced the appointments of *WESCOTT W. CHERRY* as sales manager, shipping container division; *CHARLES W. TOMLINSON* as sales manager, folding carton division; *FRANK A. BARNES* as sales manager, specialties division; *GEORGE A. WILLIS* as assistant sales manager, corrugated division at Windsor, Ont.

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HANCHETT MAMMOTH AK

KNIFE AND SHEAR BLADE GRINDER

World's finest heavy-duty traveling wheel grinder for high speed grinding with extreme accuracy and efficiency. Fully equipped to your own specified requirements. Can be furnished in either built-in motor drive or V-belt drive.

Widely used for paper, planer, hog, barker, chipper, and veneer knives. AK grinds flat or concave bevel on any desired angle or square edge. Built in lengths from 84" to 350" and longer when required.

SPEEDS 10 TO 100 FT. PER MIN.

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Set up a Scrap Salvage Program in your plant* and help keep the steel coming! Non-ferrous scrap is needed, too!

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The Paper Industry Necrology

Charles S. Boyd

Associated with the paper industry for more than 50 years, *Charles S. Boyd*, president and treasurer of Appleton Coated Paper Co., Appleton, Wis., died January 28 while vacationing in Miami, Fla. He was 80.

An 1893 graduate of Lawrence College, Mr. Boyd later attended the University of Chicago, after which he travelled for Moser Paper Co. From 1900 to 1905 he was with George A. Whiting Paper Co. of Menasha and was sales manager for what is now Whiting-Plover Paper Co., Stevens Point. In 1905 he organized Charles S. Boyd Paper Co. in Kaukauna, manufacturing a line of cover paper. In 1907 the firm was moved to Appleton, becoming Appleton Coated Paper Co.

D. G. Stenstrom

For more than 40 years prominent in Canada's pulp and paper industry, *D. G. Stenstrom*, 65, died January 31 in Royal Jubilee Hospital at Victoria, B. C. He was general manager of Celgar Development Co., a subsidiary of Celanese Corp. of America, and at the time of his death was in charge of plans for a new $65,000,000 pulp and paper plant.

A native of Sweden, Mr. Stenstrom came to Canada in 1910 and in 1914 became associated with Pacific Mills, Ltd., being appointed general manager of the British Columbia plant in 1929. In 1943 he was made deputy newsprint administrator for the Dominion. He joined Celanese in 1947.

M. E. Leeds

Associated with the manufacture of electrical measuring instruments for more than 50 years, *Morris Evans Leeds*, chairman of the board of Leeds & Northrup Co., Inc., Philadelphia, died February 8 in Lake Wales, Fla., while vacationing. He was 82.

Mr. Leeds founded the firm as Morris E. Leeds & Co. in 1899 and in 1903 went into partnership with Edwin F. Northrup. He served as president of the firm until 1939. A graduate of Haverford College, he was at one time president of Scientific Apparatus Makers of America, a trade association that he helped establish.

During the 1930s he was a member of the Hoover Emergency Employment Committee, the Advisory Council to the President's Committee on Economic Security, and the Business Advisory Council of the U. S. Department of Commerce. In addition, during that period he served as chairman of the Pennsylvania State Employment Commission and the Industrial Advisory Board of the National Recovery Act.

M. E. Leeds

A. G. Peterson

A. G. Peterson, 64, general sales manager of the eastern division for Corn Products Refining Co., died at his home in New York, N. Y., February 11. He joined Corn Products in 1907; was made manager of the Philadelphia office in 1918; division manager in 1939, and vice president in 1939.

Joseph E. Holmes

President of Chemical Paper Mfg. Co. and of Crocker-McElwain Co., *Joseph E. Holmes*, 71, died at his Springfield, Mass., home January 20. He had been associated with the firms since 1918, having served previously as assistant treasurer of the Springfield Institution for Savings. He was named president of the two companies in 1940 on the death of Clifton A. Crocker. Mr. Holmes was a graduate of Dartmouth College and a director of the Springfield National Bank.

Samuel N. Spring

Founder of the school of forestry at the University of Maine, *Samuel N. Spring*, 76, died February 3 at Atlanta. He was dean emeritus of the New York State College of Forestry, Syracuse. He retired as dean in 1944, moving to Atlanta last fall.

A graduate of Yale, Mr. Spring received a Master of Forestry degree from the university in 1903. For a time he was employed by the United States Bureau of Forestry, after which he organized the forestry school at Maine. From 1909 to 1912 he was Connecticut state forester and secretary of the Connecticut Commission on Investigation of Taxation of Woodlands. He later taught at Cornell, Yale, and the University of Missouri. He joined the New York College of Forestry as assistant dean in 1932.

Gustav S. Hellstrom, 46, beater engineer at Escanaba Paper Co., Escanaba, Mich., for the past 17 years, died recently.

A. A. Donahm, 70, until his retirement five years ago manager of the woodland department of International Paper Co. in Georgetown, S. C., died December 18.

Edward E. Schraff, 80, founder in 1915 of the Schraff-Koken Box Co., died in St. Louis December 28. He retired from active business in 1946, when the firm was purchased by International Paper Corp. Mr. Schraff was at one time head of the St. Louis Merchants Exchange.

Benjamin D. Rogers, formerly director of personnel and a director of Bird & Son, Inc., East Walpole, Mass., died suddenly December 27. On December 30, *Creighton Hill*, Mr. Rogers' successor, died unexpectedly.

Thomas Harriott, 44, office manager of River Raisin Paper Co., Washington, Pa., died January 24.

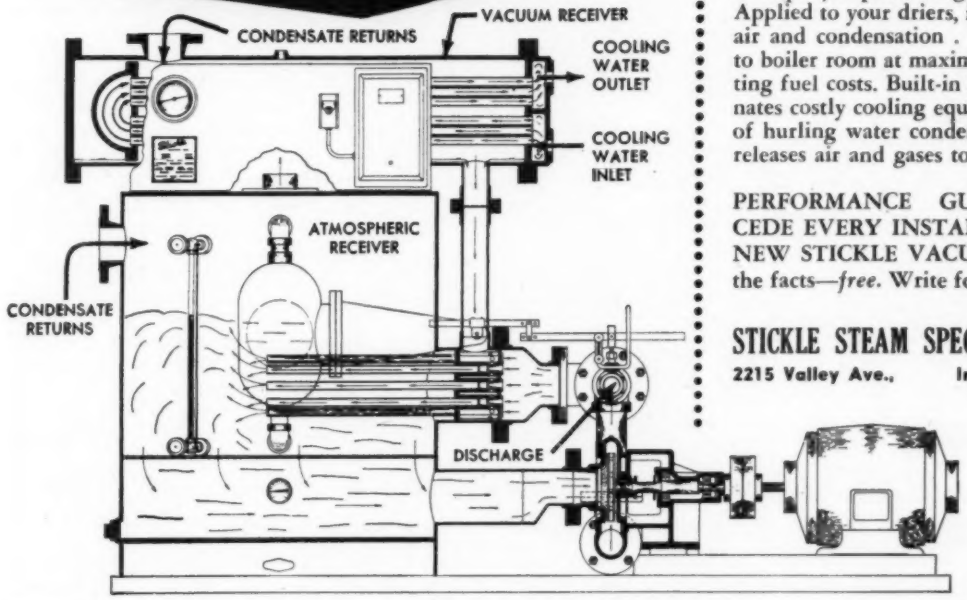
Phil Huber, chairman of the board of Ex-Cell-O Corp., died February 7 at his Detroit home. He was 62. A native of Germany, Mr. Huber, in addition to being one of the founders of Ex-Cell-O, was president of Michigan Chrome & Chemical Co., and a director of the Industrial National Bank and Midwest Abrasive Co.

I. B. Maltz, co-owner and president of Houston Paper Co., died January 3. He was 56.

Percival W. Eason, 70, board chairman of Lathrop Paper Co., New York, N. Y., died Jauary 27. Associated with the firm for more than 50 years, he was president from 1935 to 1949.

Fred C. Brigham, former superintendent of the Morgan Envelope Div. of U. S. Envelope Co., died at his Springfield, Mass., home December 24. He joined the firm in 1904.

LET'S LOOK INSIDE
the new STICKLE Vacuum Pump



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Unit is designed for vacuums up to 28", with multiple jets permitting stepped up capacities. Applied to your driers, it will rapidly remove air and condensation . . . return condensate to boiler room at maximum temperature, cutting fuel costs. Built-in heat exchanger eliminates costly cooling equipment. Recirculation of hurling water condenses flash vapors and releases air and gases to atmosphere.

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COMPLETELY PACKLESS
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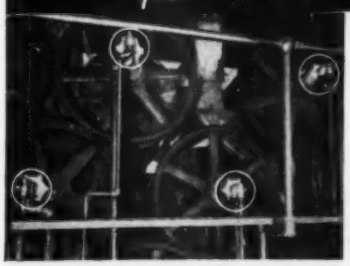
Only Johnson Joints offer *all* these cost-cutting, trouble-saving, production - boosting benefits. *Only* Johnson Joints end *all* the shortcomings of old style stuffing boxes, without compromise of any sort. No wonder so many hundreds of mills, and so many machinery manufacturers, have standardized on Johnson Joints. Why not find out how quickly Johnson Joints can pay their own way in your mill.

Johnson Rotary Pressure Joints



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Installation in a midwestern mill — some of the 562 Johnson Joints purchased by this company.

The JOHNSON CORPORATION, 845 Wood Street, Three Rivers, Michigan

The Paper Industry Safety News

Final 1951 Contest Scores Announced

The National Safety Council recently released the final tabulation on the 1951 Paper Industry Safety Contest. The overall accident rate is down 3 per cent from 1950. Thirty-one contestants maintained perfect scores, compared to 46 for the nine-month period.

The total exposure reported by all contestants during the past year was 475,736,000 man-hours, which is an increase of 6 per cent over the reported 1950 exposure. A total of 5,593 injuries was reported, which is 7 per cent higher than a year ago.

The Pulp and Paper Div. reported 356,679,000 hours worked with a total of 3,423 injuries. Compared with the previous contest, the exposures and injuries were 2 per cent and 3 per cent less, respectively.

The exposure for the Paper Converting Div. (119,057,000 hours) was up 41 per cent over a year ago, and the number of reportable injuries (1,253) was 21 per cent higher.

From these group winners the board of judges will choose the mill with the most outstanding record. That mill will be awarded the grand prize, the Edward Benton Fritz Memorial Trophy, presented by THE PAPER INDUSTRY.

Division I—Pulp and Paper Mills

Group A

1—Kimberly-Clark Corp., Kimberly, Wis.
2—Ecusta Paper Corp., Pisgah Forest, N. C.
3—Price Bros. & Co., Ltd., Kenogami, Que., Canada

Group B

1—Fraser Paper, Ltd., Madawska, Me.
2—West Virginia Pulp and Paper Co., Tyrone, Pa.
3—Consolidated Paper Corp., Ltd., Laurentide Division, Grand Mere, Que., Canada

Group C

1—West Virginia Pulp and Paper Co., Williamsburg, Pa.
1—Congoleum-Nairn, Inc., Cedarhurst, Md.
3—Brunswick Pulp & Paper Co., Brunswick, Ga.

Group D

1—Certain-Teed Products Corp., Marseilles, Ill.
1—The Mead Corp., Manistique, Mich.
1—United States Gypsum Co., Oakmont, Pa.
1—Marathon Corp., Ashland, Wis.
1—Lloyd A. Fry Roofing Co., Compton, Calif.
1—The Mead Corp., Nashville, Tenn.
1—Riegel Paper Corp., Riegelville, N. J.
1—Johns-Manville Corp., Tilton, N. H.
1—Volney Felt Mills, Inc., Mishawaka, Ind.
1—Spaulding Fibre Co., Inc., North Rochester, N. H.

Division II—Paper Converting

Paper Bags

1—St. Regis Paper Co., San Leandro, Calif.
1—St. Regis Paper Co., Ltd., Dryden, Ont., Canada
1—Thilmany Pulp & Paper Co., Kaukauna, Wis.

Boxes and Cartons

Group A

1—Stone Container Corp., Chicago, Ill.
1—Fibreboard Products, Inc., South Gate, Calif.
3—Container Corp. of America, (Folding Division), Philadelphia (Manayunk), Pa.

Group B

1—Container Corp. of America, Greensboro, N. C.
1—Gaylord Container Corp., Greenville, S. C.
1—Container Corp. of America, Baltimore, Md.
1—Container Corp. of America, Philadelphia (Sixth St.), Pa.
1—Southwest Corrugated Box Co., Sand Springs, Okla.
1—Southwest Corrugated Box Co., Fort Worth, Tex.
1—Hankins Container Co., Miamisburg, Ohio
1—Bay West Paper Co., Green Bay, Wis.

Roofing Paper

1—Johns-Manville Corp., Marrero, La.
1—Lloyd A. Fry Roofing Co., Stroud, Okla.
1—Johns-Manville Corp., Los Angeles, Calif.

Insulation and Building Board

1—Johns-Manville Corp., Jarratt, Va.
2—National Gypsum Co., Mobile, Ala.
3—The Flintkote Co., Meridian, Miss.

Specialties

1—Old Colony Envelope Co., Westfield, Mass.
1—Kimberly-Clark Corp., Appleton, Wis.
1—Research Products Corp., Madison, Wis.
1—Lily-Tulip Cup Corp., French Lick, Ind.

Accident Frequency up in Southern Safety Report

According to the nine-month report of the Southern Pulp & Paper Association, accident frequency in the mill division now stands at 10.26, as compared to a rate of 9.31 for the first six months of 1951. For the year 1950 the over-all rate was 11.03.

Mead Corp., Nashville, Tenn., is shown as the only mill in the zero frequency classification. At the six-month point there were four operations having that distinction.

Among the 55 mills reporting there has been considerable jockeying of position since the six-month report. Only three mills maintained the same position which they maintained during the first half of the year. Thirty-six of the 55 mills improved their positions, while 16 of them lost ground. The gains ranged from one position improvement to a high of 13. The latter was reported by Certain-Teed Products Corp. of Savannah, which at the time of the last report stood in 39th position and now stands in 26th.

Changes in the converting industries were less obvious. Bag plants in the first six months had a rate of 13.41 and now show a rate of 12.20. Their average for 1950 was 7.43. Box plants all showed a reduced frequency from 10.14 to 9.29, while woods operations had a nine-month rate of 39.02.

K-C Sets Record

On November 15, 1951, the Kimberly, Wis., mill of Kimberly-Clark Corp. reached 2,616,656 man-hours without a lost-time accident to set a new all-time record for mills of the Kimberly type.

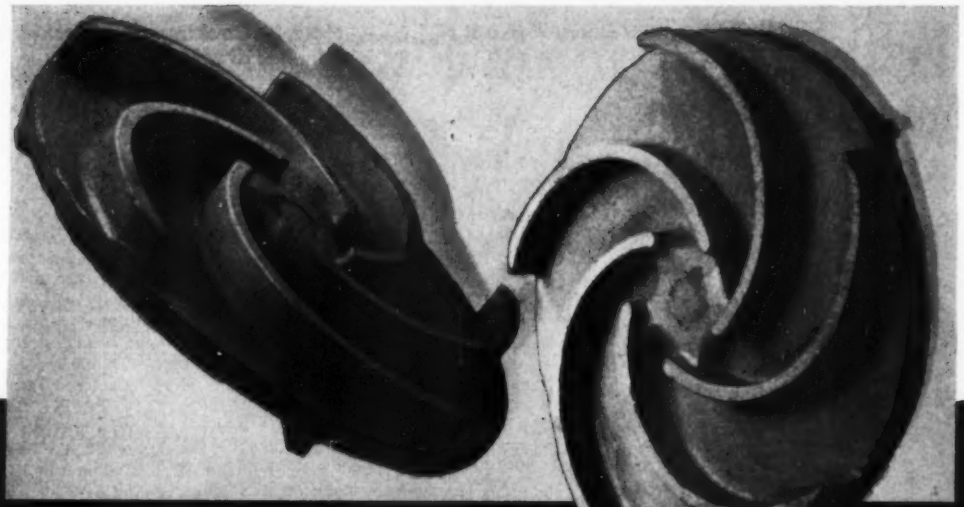
It was the second recent accomplishment for the firm, which on September 10 set a new record for K-C mills in the United States. Their goal now is Hollingsworth & Whitney's record for the industry of 3,343,598 man-hours.

Coos Bay Pulp Corp.,

Anacortes, Wash., recently announced that its 1951 accident record was the second lowest of all Scott Paper Co. mills in the United States. According to the plant's records, there were only four accidents during the year. None was fatal. As a result of the record, Leonard Kruger, one of the mill's 12 safety captains, attended the parent firm's annual safety banquet in Philadelphia January 31.

Correction

In the November, 1951, issue of THE PAPER INDUSTRY, the Honorable Mention in the Best Safety Device Contest (1950-1951) that was awarded to Canadian International Paper Co., Montreal, Canada, for a safety hook for standard extension ladders gave the name of I. H. Robinson, manager of industrial relations as having submitted the report. Full credit for this device should have been give to Mr. Charles Ernest Solly, head painter at Canadian International's mill in Three Rivers, Que.



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Michigan Steel Casting Company

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Knox "Excelsior" Felts — *Splicing Tissues*
Siamese & Richland Dryer Felts — *Deckle Webbing Etc.*

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Foreign Abstracts . . . . . .

Hydrafiner studies

Beating experiments with a hydrafiner No. 1 were carried out at the Kraft mill of the United Paper Mills Ltd., at Walkiakoski, Finland, and reported by their mill engineer. The so-called batch system and two different motor speeds were used.

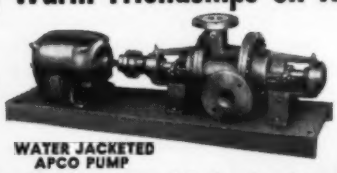
In the first instance, the number of revolutions of the 150 KW. motor was 1450. The perpendicular gap between the bars of the hydrafiner was 0.5-1.3 mm. at pulp consistencies of 2-5 per cent. Sulphate pulp was used. At higher consistencies, the tearing strength reached a maximum value very rapidly and remained almost unchanged throughout the beating process. Breaking length and burst improved very gradually with the beating period. When the operation was carried out at low consistencies, the results were somewhat similar to those obtained with jordans, but actually better in the hydrafiner. By throttling the "through put," the effects of beating are magnified.

In the second set of experiments, the motor was limited to 980 revolutions per min., and the gap between the bars was 0.18-0.22 mm. This vigorous treatment yielded pulp with good strength properties and relatively favorable power consumption. When moving to higher consistencies (with the motor at 980 rpm.), a centrifugal pump was introduced and connected to the feed end of the hydrafiner. This permitted the maintenance of sufficient "head." Variation of the through put did not affect strength properties. Desired pulp properties could be obtained by changing pulp consistency. Twenty-one graphs and 10 references. Erkki K. Tolvi. *Paper and Timber* (Finland). 33, 338-342 (1951). (Original in Finnish, with English summary).

Rayon-grade pulp in India

Although two Indian rayon plants (one in Travancore, and the other in Bombay) are nearing completion, they will have (for the present) to depend on the importation of foreign pulp as their raw material. The author stresses the undesirability of this dependence and outlines the possibility of using indigenous cellulosic raw materials. Bamboo is mentioned as a possible source of such material. The use of "macromolecular staple fiber" is evidently required, but no experimental details are given. Lavji Thoria. *Indian Pulp and Paper.* 5 (Anniversary Number) 24-25; 34 (1951).

Making Warm Friendships on Hot Jobs



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Cooking of bleachable Kraft pulp

A four-stage bleaching schedule for determining the bleachability of kraft pulp is described. As a means of characterizing the "bleachability," the following limiting techniques were used. The consumption of hypochlorite on bleaching to a certain degree of brightness was noted and measured. The brightness reached on bleaching to a specific viscosity was also measured. This brightness value represents the "quality factor" of the pulp.

The strength of a pulp is relatively independent of the average degree of polymerization until a cuprammonium viscosity of about 35 cp. is reached (according to CCA 16) ($\simeq$ 33 cp. TAPPI). Below this point, however, the pulp strength diminishes rapidly. For this reason, the brightness was determined at this "limiting" viscosity.

When a sulphate cook is continued after the alkali has been essentially consumed, bleachability becomes much more difficult, and eventually there is even an increase in Roe chlorine number. This is ascribed to a lignin condensation. When such undue condensation is avoided, the brightness at 35 cp. (viscosity) will be higher, the higher the original chlorine number. Increase in the cost of bleaching agents is counterbalanced by higher pulp yields.

The strength of the pulp at 35 cp. is practically independent of the original chlorine number. Consequently, in a kraft cook, the author suggests that the digestion be interrupted at as early a stage as possible (compatible with screenings). Christian Valeur. *Svensk Papperstidn.* 54, 613-620 (1951). (Original in Swedish, with English and German summaries. The five tables and ten figures are in English).

Delignification of birch and of a grass from Ecuador

In the case of spruce lignin, there appear to be two types of sulphonatable groups: "A," those that can be sulphonated by means of acid, neutral, or slightly alkaline sulphite solutions, and "B," those which can be sulphonated and removed only by an acid cooking liquor. When neutral sulphite liquor (pH 6) is used, the greater portion of the lignin is not removed, but those groups which can be sulphonated at pH 6 and 135 C. fall into the "A" group.

In order to study differences between mono- and dicotyledons, neutral sulphite solutions were allowed to react with birchwood (a typical dicotyledon) and a grass from Ecuador, closely related to bamboo, *"Cana guadua."* The delignification was followed by determining methoxyl groups still remaining in the pulp (which is admittedly inaccurate, especially in the case of birch). Guadua, which contained 4 per cent methoxyl and 23.1 per cent klason lignin (which contained 15.5 per cent methoxyl) lost over 65 per cent of its lignin (i.e., 65 per cent of its methoxyl) at pH 7, within 12 hours, cooking at 135 deg., and about 70 per cent within 25 hrs. In contrast, the birch lost only about 20 per cent of its methoxyl as neutral sulphite digestion in 25 hours.

The authors also furnish tabulated data on the sulphur-methoxyl ratios in the un-

dissolved lignins remaining in the respective pulps. Evidently, the lignin in birch cannot be sulphonated (by neutral sulphite) to the same extent as can spruce; hence, less "A" groups are present in birch. The special analytical technique for determining sulphur in guadua is described. Three graphs and 12 references are given. Bengt O. Lindgren and Ulla Saeden. *Svensk Papperstidn.* 54, 795-98 (1951). (In English).

Effect of formic acid on Sulphite cooking liquor

The presence of small amounts of formic acid (in concentrations of about 0.05 per cent) in sulphite cooking liquors may contribute to their decomposition during the sulphite cook. In higher concentrations (about 0.2 per cent), when the lime content is relatively low, "burnt cooks" may result.

Sprucewood contains about 0.3 per cent formyl groups, which are split off during the digestion. Most of these are oxidized to carbon dioxide by the bisulphide ions, and the reduction product is thiosulphate, which is known to cause further decomposition of the bisulphite. The original reaction conforms to the following equation—$2HSO_3^- + 2HCO_2H \rightarrow S_2O_3^{=} + 2CO_2 + 3H_2O$. An analogous reaction takes place in the case of sugars, which are oxidized to aldonic acids.

The author also outlines those reactions which show the catalytic effects of thiosulphates on bisulphite, which is autocatalytically decomposed (sulphate ions being one

	Bisulfite-CaO, %	$S_2O_3^{=}$ g./lit.	$SO_4^{=}$ g./lit.
Before heating	0.93	0.03	0.202
After heating:			
Add. of 0.5 g. HCOOH/lit.	0.89	0.47	0.300
» » 2.0 » » »	0.39	2.28	0.743
» » 2.6 » HAc »	0.88	0.02	0.237
» » 1.4 » CH_3OH »	0.92	0.03	0.194
» » 1.3 » CH_2O »	0.84	0.04	0.188
Without addition	0.93	0.03	0.224

of the products). Table shows the influence of various organic compounds on the stability of cooking acid. From this it is evident that acetic acid, methanol, and formaldehyde show none of the marked effects manifested by formic acid. Small amounts of formic acid (presumably slip off at the end of a cook when combined SO_2 is low) may be found in relief gases, and it is advisable to keep down the concentration of this acid in high-pressure tanks. Formic acid and thiosulphates are also transferred from cook to cook through side relief. This may become manifest in the production of rayon pulp where the lime content is relatively low and temperatures are relatively high. In the manufacture of greaseproof papers or strong sulphite pulps such effects, however, may be negligible. The influence of formic acid on the stability of cooking liquor at 135 deg. over various time periods, the effects of formic acid concentrations and of temperature, and the action of sugars, *et al,* are fully discussed.

Fortunately, at the start of a cook (when amounts of HCO_2H and sugar are slight), the bisulphite concentration is highest, but these conditions are reversed during the

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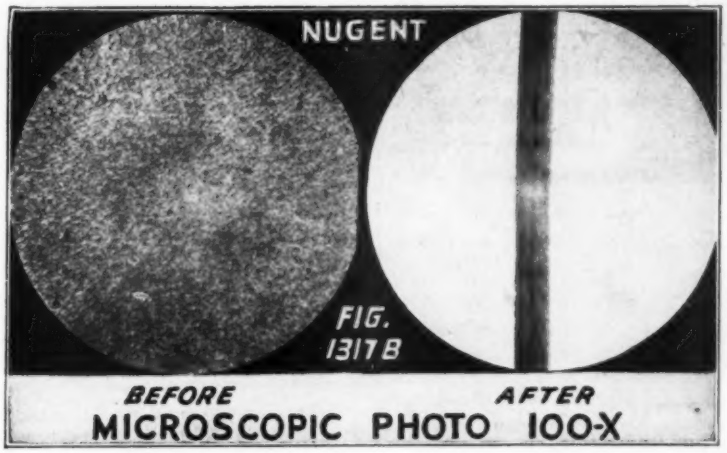

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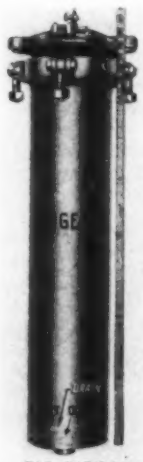

FIG. 1280A • 4L

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cook. It is possible (cf. Samuelson and Westlin. *Svensk Papperstidn.* 50, No. 11. 29) that thiosulphate ions may be transformed into other sulphur compounds which do not exert the same deteriorating effects on bisulphites. Nine figures, six tables, and twelve references are given. Lennart Stockman. *Svensk Papperstidn.* 54, 621-627 (1951). (In English).

Penetration of starch, used as adhesive, into paper

Starch, used as a binder for pigments employed in surface coating of unsized paper, penetrates the sheet to a certain extent. This penetration (measured in microns) decreases with increased hydration of the stock. Penetration of the pigment (such as umber), however, shows no such marked change. When the stock was sized, starch penetration decreased markedly, and extensive beating had relatively little effect. The author also discusses the effect of the degree of beating on smoothness of coated paper (not subjected to satinage). Such smoothness increases sharply (especially with sized stock) up to about 25 deg. Schopper-Riegler and then decreases.

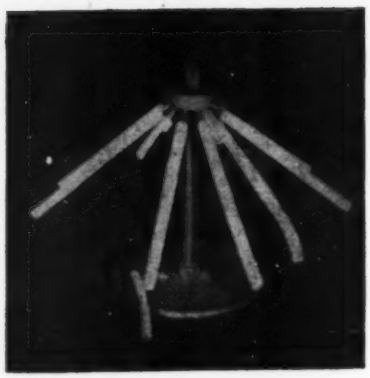
With unsized paper, the higher the moisture content the deeper the starch penetration; this is a nearly linear relationship. However, this increase was *not* noted with sheets sized with 1 per cent rosin.

Other differences between sized and unsized sheets are briefly noted. Tabulated data, 3 graphs, but no references are given. Ober. *Allg. Papier-Rundschau* (1951). 1034-36 (in German).

Quantitative combustion of cigaret papers

The older French technique, which involves placing ten tobacco-filled cigarets on a balance pan, causing them to burn, and determining the over-all loss in weight per minute (per cigaret), has been found unsatisfactory. The technique, described by Sagrista *(Quimica de la fabricación del Papel)*, in which the paper alone is used, and in which the surface consumed within a definite time period is measured, was found unreproducible. Hence, the present authors have devised the following improved method.

A series of ten (empty) cigaret paper tubes was rolled under carefully standardized conditions, in a fully described (illustrated) apparatus. The sheets used in making such tubes were 29-30 mm. wide and 10 cm. in length. Each tube was clearly marked at the mid-point (5 cm.). The tubes were then placed, as shown in Figure 1, suspended at a 45 deg. angle on a circular stand, within a specially devised combustion chamber, maintained at a specific temperature (40, 60, or 80 C.). They were allowed to come to equilibrium, and then each tube was (successively) ignited. The time was noted (by stop-watch) during which *the 1st half* of each tube was consumed. At 40 deg., for papers treated to render them combustible, this was usually about 50 sec. Poorly combustible papers required about 80 sec.; "non-combustible" tubes took over 100 sec. At higher (chamber) temperatures, the combustion was slightly more rapid, but acceleration was not very great (4-7 per cent).



In general, at 40 deg., the reproducibility was within about 5-10 per cent (as compared with 30-45 per cent by Sagrista's technique.

The authors give extensive tabulated data. This work was carried out at the Annex of the Laboratoire Central des Services Chimiques de l'Etat. P. Tournoux and J. Prat. *Bull. Assoc. tech. de l'ind. papetiere.* 5, No. 7, 378-83 (1951). (In French).

Birchwood and bark

The chemical and technological properties and morphology of outer and inner barks and of two species of birchwood *(Betula verrucosa* and *B. pubescens)* are discussed, and an excellent literature survey of the chemistry and morphology of birch is given. This review includes (the not easily accessible) analytical data of T. Arnborg [*Svenska Skogsvardsföreningens Folkskrift,* Ser. II, No. 1 (1949)].

The outer bark contains about 38 per cent ether-soluble material, whereas the wood contains only about 1.3 per cent. Alcohol solubles in the outer bark comprised 5.6 per cent; the inner bark contained 13.7 per cent, and the wood 1.8 per cent. The outer bark also contained 38.7 per cent suberin, very little lignin (as judged by the methoxyl content of the acid-insoluble portion), only about 1.1 per cent pentosans, and "3.4 per cent hexosans" (determined after complete hydrolysis). On the other hand, the wood contained 25.3 per cent pentosans and 43.4 per cent hexosans. (These are Arnborg's figures.) Acetyl and formyl groups were much lower in the barks than in the wood, but nitrogenous materials were much higher in the barks. Surprisingly, the ash content of the outer bark was only 0.4 per cent; that in the inner bark was 1.8 per cent.

Pulps suitable for many purposes could be produced from the wood. The kraft process yielded higher and stronger pulps than did the sulphite process. Papermaking properties are limited by shortness of the fiber. The properties of sheets made from birch pulp alone (and admixed with pine pulp) are tabulated. The author suggests that semichemical processes may open the way for new possibilities in birchwood utilization.

Sixteen figures, 4 tables, and 26 references are given. Waldemar Jensen. *Svensk Papperstidn* 54, 739-745 (1951). (Original in Swedish, with English and German summaries; but tables and figure captions are in English).

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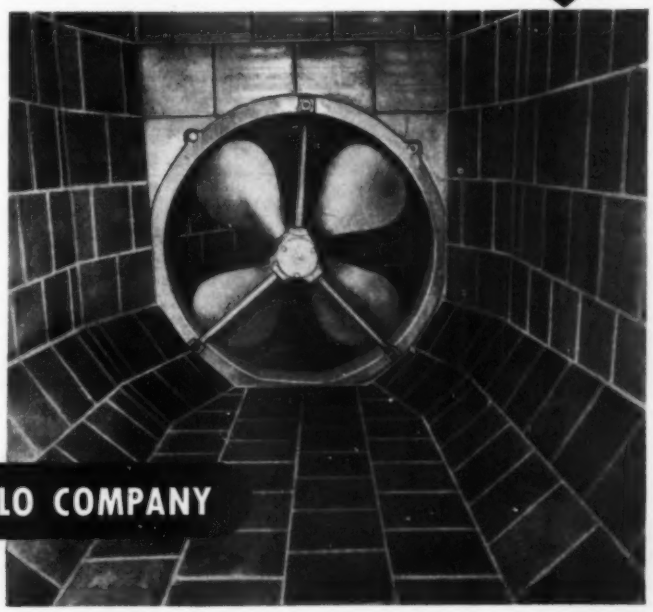

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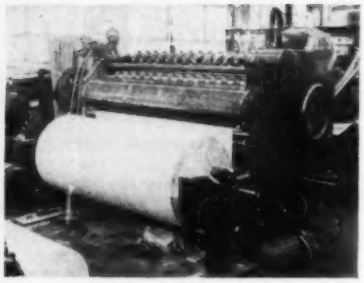


Toilet winder

A new 60-B toilet winder that operates continuously at a constant speed and delivers uniform count rolls without stops, other than a change of parent rolls, has recently been made available.

Each shaft of completed rolls is carried through seven stations during the winding process. Ten winding shafts are used to complete each cycle. The operator places a core the entire width of the parent roll in station No. 1. It is carried to station 2, where the cores are cut to required width. Station 3 places glue on individual cores. The paper is attached to the cores in station 4, where it is automatically broken from the preceding roll. The proper number of sheets are wound on the cores at station 5; the webs are broken and loose ends carried back to station 3. Loose tails are wound on the completed rolls in station 6 and delivered to the cycle at station 7. The whole operation calls for two manual processes, viz. loading the core shafts and removing the completed rolls.

The parent roll contacts an unwind roll with a uniform tension control. Glue is applied hot or cold by glue wheels. The perforation roll is fitted with means to provide a uniform perforation. An embosser can be attached to the unit so that the paper may be embossed with any uniform pattern during the winding cycle. This machine may be built to accept rolls up to 81 inches in width.

While the automatic features of this machine demand a more or less standardization of its output, means are provided for a limited number of sheet counts. One machine installed is producing as high as twenty-four cases per hour with 650 sheets per roll. In all cases, the output of machines installed is well over the normal production of the machines they have replaced.

It is obvious that uniform parent rolls without loose ends should be used. The ideal paper for the machine would be semi-crepe and facial tissue, although straight machine papers are used on the machines with a satisfactory production. *Hudson Sharp Machine Co., 1201-07 Main St., Green Bay, Wis.*

Knife grinder

The new Rogers "NT Junior" combines speed and low cost for precision grinding of woodworking, paper cutting and other straight knives and is intended for light-duty work. One of the outstanding features is the separate reversing motor which drives the sturdy reciprocating knife table assembly. Another is the combination of carefully machined angular "V" and flat ways over which the table travels. These broad ways transmit all grinding pressures to the base of the machine where they are easily absorbed.

The "NT Junior" is designed for a 10-inch diamater cup grinding wheel to be driven by a separate ball bearing motor. It is available in four sizes, and the stroke is adjustable to any length within these limits. *Samuel C. Rogers and Co., 193-210 Dutton Ave., Buffalo 11, N. Y.*

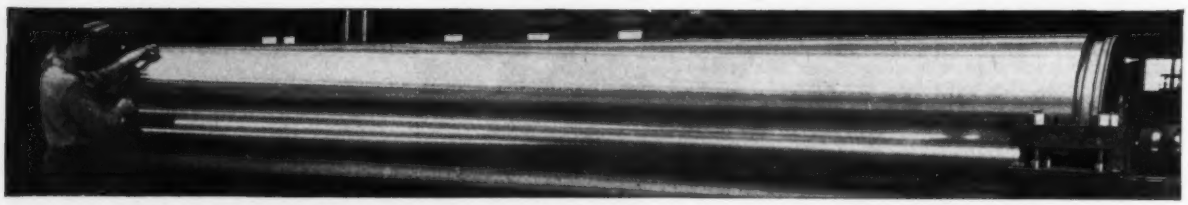
Emergency light

An automatic emergency light which plugs into any socket 110 ac outlet (dc available) offers light when regular power fails. If the regular lighting circuit is interrupted, this light, GS No. 16, will come on automatically from power supplied by a standard 6 or 7½ volt dry battery. It clamps on to the battery and is adjustable in any direction. The self-contained unit furnishes emergency light for operation of switches, valves, controls, for making repairs, etc. *General Scientific Equipment Co., 2700 W. Huntingdon St., Philadelphia 32, Pa.*

Centrifugal cleaner

A new 6-in. Vortrap, built particularly for cleaning liner stocks for cylinder machines, has recently been introduced to the market. Another application is the cleaning of deinking stocks which may contain large quantities of foreign matter.

Previously, combinations of 4-in. Vortraps have been recommended, but such systems require more units, more expense, and more equipment to be effective; and plugging may occur on heavy dirt content stocks. One 6-in. Vortrap has sufficient capacity to handle the average cylinder ma-



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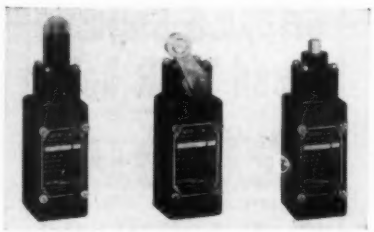
chine vat, and the installation can be simple and compact. It can be furnished for manual or automatic dumping of rejects.

Suggestions for a typical system would include cleaning all of the stock to an individual mould before screening. Thus, one unit would clean up to 25 tons of stock per day and remove the heavy foreign matter before it has contaminated the screen. Screens then would serve to remove fibre bundles, shives, cork and similar light particles for cleaning. Screen capacity can therefore be increased appreciably. Such systems can be arranged for complete automatic operation on a continuous 24-hour day basis. *Nichols Engineering & Research Corp., 62 Wall Tower, New York, N. Y.*



Switches

Two new actuators have been added to Minneapolis-Honeywell's type "ML" Micro-Limit line of heavy-duty precision limit switches. The original type "ML" switch, 1ML1, has an adjustable roller arm actuator, while one new type, 2ML1, has a straight plunger actuator and the other new type, 5ML1, has a roller-plunger actuator. The roller-plunger actuator is adjustable 90 deg. in either direction to place the roller in line with the actuating force.

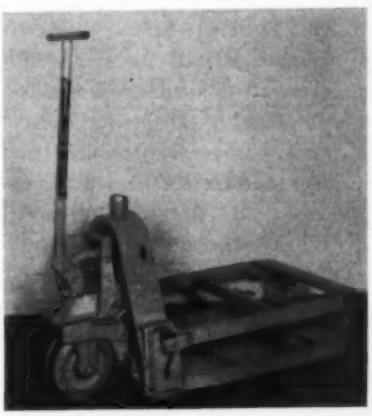
The 1ML1 switch is suggested for use with fast moving cams or in places where it is difficult to locate the switch properly in relation to the direction of the operating force. The 2ML1 is suggested for use where operating force is applied directly in line with the plunger movement, and the 5ML1 is suggested for use with slow moving cams. *Minneapolis-Honeywell Regulator Co., Micro Switch Div., Freeport, Ill.*

Mastic flooring

A new process has been developed in the manufacturing of industrial mastic floors in which Uintahlite, a mineral stabilizer of high efficiency, is utilized for the first time.

This added stabilizer, now an exclusive feature of the Texas Jack Resurfacer, imparts strengths and resistances to the whole material when installed which have decreased dimensional movement to the point where ruffing, waving, and the transfer of irregularities in surface of the old floor through the new mastic surface have become practically non-existant. The "pull" on vehicular traffic is reduced and indentation under static loadings is eliminated. Propulsion effort is considerably reduced.

Another feature of the new asphalt mastic floors is the compatibility to a coal tar water emulsion which, thinly coated over the floor gives almost complete protection against oils, gasoline, most solvents and virtually all acid and alkaline solutions. *Flash-Stone Co., 30 E. Rittenhouse St., Philadelphia 44, Pa.*



Pallet truck

Hand lift pallet trucks are now available with a dual-purpose superstructure that will enable them to handle 7 and 12-inch skids, as well as single or double faced pallets.

When the superstructure is in a raised position, it is clamped vertically to provide a backrest for the pallet load on the truck. When lowered, it is adjustable to either 7 or 12-inch skid heights by a simple cam and slot arrangement. This truck will find application in those plants where there is not

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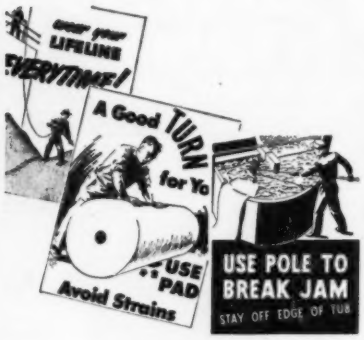

Posters should be one of the top aids in your safety program. No other safety medium can reach your entire audience—not once, but many times each day—with such low-cost safety messages. They are directed at the worker acts and worker attitudes that lead to accidents. Posters lend *timeliness, repetition* and *continuity* to your safety program . . . the three fundamental principles of direct selling.

The National Safety Council maintains a stock of posters that covers all industries, operations and phases of safety and health. These posters are produced in three sizes: "A" size, 8½" x 11½"; "B" size, 17x23"; and "C" size, 25x38". Their colorful illustrations and eye-catching captions make them ideal for the mass selling of safety.

Write for a free copy of the 1951 Directory of Occupational Safety Posters. This 72 page catalog illustrates 744 posters, indexed and classified for specific operations.

NATIONAL SAFETY COUNCIL

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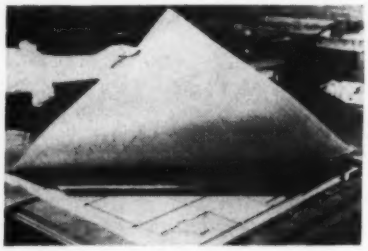
sufficient volume of either skids or pallets to keep a specialized truck for each one busy or where flexibility is desired because of varying loads.

The truck is available in either mechanical or hydraulic lifts. Platform trucks can be similarly equipped so that they can handle several sizes of skids. *Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia, Pa.*



Plastic sheets

A new method using Vinylite plastic rigid sheet to check register between cutting dies and printing plates is now being utilized in paper box printing. Good dimensional stability also makes this transparent plastic useful for checking register while engraving the original plates. Resistant to moisture, grease, oil, ink, and most chemicals, the plastic rigid sheets can be washed with plate wash or similar volatile solvent after use in either process, and reused several times. *Union Carbide and Carbon Corp., Bakelite Div., 122 E. 42nd St., New York 17, N. Y.*

New Products Briefs . . .

INTERCOMMUNICATIONS SYSTEM—The new Talk-A-Phone CL Series offers a flexible combination from which incoming calls may be answered from a distance of up to 40 ft. from any master station or substation, and in which master stations may talk with each other, sub-stations may be called selectively, or exclusively from any master station, and any master may be used privately or non-privately. *Talk-A-Phone Co., 1512 S. Pulaski Rd., Chicago, Ill.*

CLEANER—Magnus 751 is a new cleaner which removes carbonaceous deposits from the tubes of fuel oil heaters without need for dismantling the equipment. Instead of removing the fouled tubes, cleaning is accomplished by exposing the deposit on the tubes to the action of this cleaner. *Magnus Chemical Co., Inc., South Ave., Garwood, N.J.*

GRAVITY ROLLER CONVEYOR—Designed to overcome almost any installation problem with only three units: straight sections, 90 deg. curved sections, and adjustable trestles. Handling and transporting of cartons, packages, boxes, pallets, etc. is by gravity or hand propulsion. *Lyon Metal Products, Inc., Aurora, Illinois.*

LIFT TRUCK—The Buda pneumatic tire 2000 lb. capacity fork trucks enhance fast handling, operating economy and low maintenance. Powered with a 4-cylinder, 61-cu.-in. displacement engine, models in this line are available in five standard masts with a lift of 72 in., 84 in., 108 in., 114 in. and 120 in. *The Buda Co., Harvey, Illinois.*

TEXTILE PRESERVATIVE—A safe preservative for textiles and other materials has been developed to prevent the attack of micro-organisms. Applied to material by the standard two bath process, wide use of the product is foreseen to treat fabric for tents, tarpaulins, and other goods with outdoor exposure. *Dow Chemical Co., Midland, Mich.*

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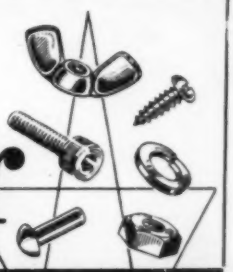

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The Paper Industry New Literature

Books

CHEMISTRY OF WOOD. By Erik Hagglund. Published by Academic Press Inc., 125 East 23rd St., New York 10, N.Y. 631 pages. $13.50.

In this volume a vast amount of data on the properties and behavior of wood is presented by Dr. Hagglund of the Swedish Forest Products Research Laboratory in Stockholm.

The morphology and physical properties of wood are briefly discussed in introductory chapters which are followed by a section on the chemistry of cellulose, wood polyoses, lignin, and accessory wood constituents. Other chapters deal with various industrial processes of wood utilization such as wood saccharification, sulphite, sulphate, and semi-chemical pulping and bleaching of pulp, and wood carbonization. The chemical reactions involved in these technical processes are discussed in detail. The final chapter deals with the natural decomposition of wood.

INCENTIVE MANAGEMENT. By James F. Lincoln. Published by The Lincoln Electric Co., Cleveland 17, Ohio. 288 pages. 6 x 9. $1.00 in the U.S.A.; $1.50 elsewhere.

A philosophy through which workers and managers in business and industry can develop themselves as skillful individuals and work together co-operatively to everyone's benefit rather than work at cross purposes to everyone's expense is the main theme of this book.

The mainspring of that development is incentive, and the fundamental incentive, according to the author, is recognition of an individual's skill and the results it produces in higher pay, greater output and lower costs. How this incentive can be put into business life as it is in other phases of life and how everyone will thereby benefit is the chief concern of the author.

Some of the topics discussed are incentive, piecework in industry, the place of the union, development of personnel, how to install the incentive system, and why incentive systems fail.

FUELS AND COMBUSTION HANDBOOK. Allen J. Johnson, Editor and George H. Auth, Associate Editor. Published by McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York, N. Y. 915 pages. 6 x 9. $12.50.

Written by 240 experts in the field, this authoritative book presents a vast amount of data on all phases of fuels and combustion that are encountered in any normal plant.

The book considers the factors concerned with selecting and using the various types of fuels. It discusses the way they are used in combustion processes and shows how they are treated and prepared for use, as well as how they are handled and stored. This book also deals extensively with the transfer and generation of heat and power. More than 800 tables, charts and illustrations have been used wherever possible instead of formulas.

Many advances in such fields as synthetic fuels, the heat pump, gas turbines, spreader stokers, combustion, furnace and equipment design, package boilers, etc., are covered in this volume.

VISCOSITY AND PLASTICITY. By E. N. da C. Andrade. Published by The Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N. Y. 84 pages. 5½ x 8¾. $2.25.

The author, a well-known scientist, outlines in this book of three lectures the phenomena of viscosity and plasticity. The subject is covered with a special view to those who deal with viscous and plastic materials on an industrial scale.

Lecture I discusses the nature and theories of liquid viscosity. It aims at establishing general principles and deriving from these an understanding of the very complex behavior of flowing liquids and solids. Lecture II deals with the flow of simple liquids, suspensions, and gels. It also considers thixotropy, dilatancy and other properties affecting flow. The flow of solids is the topic of Lecture III. It covers sols and gels which can be poured slowly or with difficulty.

The 32 figures included in the book help to clarify the material presented.

Booklets and Pamphlets

METHODS OF MEASURING HUMIDITY AND TESTING HYGROMETERS. By Arnold Wexler and W. G. Brombacher. Published by the National Bureau of Standards, U. S. Department of Commerce, Washington 25, D. C. (Circular 512). 18 pages. 15 cents. In the text and in the 157 selected references, this circular answers comprehensively many questions on humidity measurement. It reviews methods for measuring water-vapor content of air and other gases and for producing and controlling atmospheres of known humidity for hygrometer testing and calibration and for general research. Numerous hygrometric techniques are discussed and suitable equipment for establishing desired humidities over a wide range of temperature is described. (Order from Government Printing Office, Washington 25, D. C.)

LIQUID CHLORINE — ITS PROPERTIES, TRANSPORTATION EQUIPMENT, AND SAFE HANDLING. Published by Solvay Technical and Engineering Service, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y. (Bulletin No. 7). 57 pages. The third edition of this booklet contains additions and revisions to the material of the widely circulated previous editions.

PAPER CUTTING: MACHINES AND TECHNIQUES. By George J. Mills. Published by George J. Mills, 4916 Forbes St., Pittsburgh, Pa. 26 pages. 8¼ x 10¾. $1.25 postpaid. This booklet is written primarily as an introduction to flat sheet cutting and handling for use by the novice. It is an elementary, illustrated manual which explains basic cutting machine principles, hand lever cutters, power cutters, points to consider in buying a paper cutter, care of cutting knives, paper storage and transport, how to jog, how to count, how to determine direction of grain, how to figure spoilage, how to estimate cutting times, time-saving methods of trimming, safety precautions, and specialty cutting and trimming machines.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Flow Signal Transmitter. Hagan Corp., Hagan Bldg., Pittsburgh 30, Pa.—This 8-page bulletin, No. 2551, describes the flow signal transmitter. Diagrams illustrate seven suggested uses of the transmitter in measurement of flow, liquid fuel, liquid level, and absolute pressure. A cutaway drawing illustrates the principles of operation. Other plates show the various types of differential measuring elements and illustrate the use of a dead weight checking attachment for reference calibration of the transmitter under full static pressure.

Flow Indicators. Trinity Equipment Corp., 472 Westfield Ave., East, Roselle Park, N. J. This new bulletin describes the features of the flow indicator. Included is an over-all dimensions chart and schedule of pressure ratings, as well as specifications of the indicator.

Trucks. Baker Industrial Truck Div., Baker-Raulang Co., 1250 W. 80th St., Cleveland 2, Ohio—Baker Report 3061 contains detailed handling information on the West Penn warehouse operation in which electric fork and platform trucks are used. Action photos are used.

Belt Feeders. Omega Machine Co., 345 Harris Ave., Providence 1, R. I.—The Belt Gravimetric Feeder is described in the 4-page bulletin No. 35-F5B. It lists the many features of the feeder and describes the operation of its pertinent parts. Photographs and diagrams are shown.

Process Machinery. The Bauer Bros. Co., 1759 Sheridan Ave., Springfield, Ohio—Designated as Bulletin No. 52, this 8-page publication illustrates and describes the Bauer diversified line of attrition mills, pulp refiners, hammer mills, crushers, breakers, magnetic

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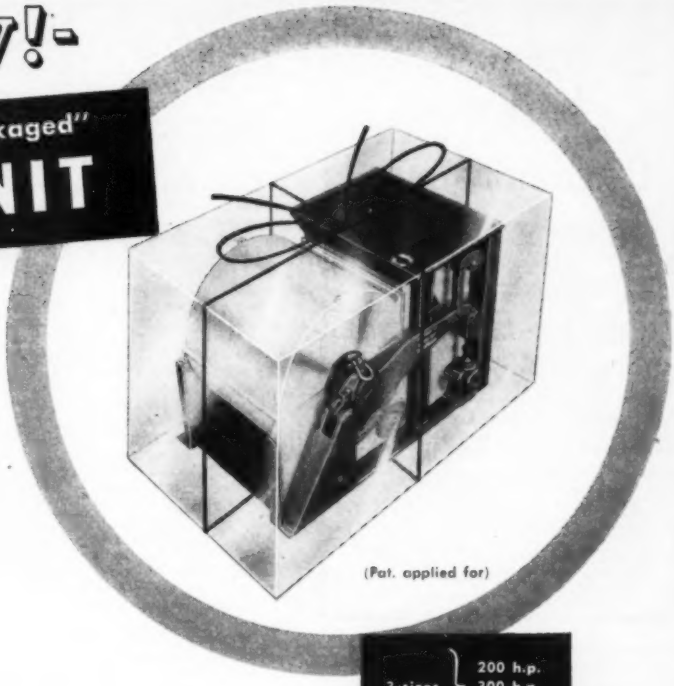

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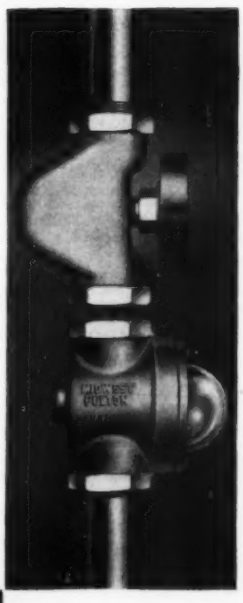

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separators, etc., in addition to laboratory mills, beaters and classifiers. It explains facilities in company's laboratories for making test runs on commercial-size machines.

Magnetic Separators. Eriez Mfg. Co., Erie, Pa.—Complete descriptions of separators, pertinent engineering data, including photographs, drawings, and tabular specifications are given in this new 16-page catalogue, No. 15. Information on the selection of the appropriate magnetic separator, the factory engineering service available, as well as a full explanation of the life of permanent magnets and the importance of application engineering are dealt with.

Aluminum Tanks. Chicago Bridge & Iron Co., 332 S. Michigan Ave., Chicago 4, Ill.—This reprint of an 8-page article, "Field Welding of Aluminum Tanks," from the Welding Journal describes the erection procedure for a 200,000-gal. and six 30,000-gal. aluminum tanks. The welding sequence used to prevent distortion or warping of the plates is discussed, and photographs show each step during the erection of the tanks.

Control System. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne and Windrim Aves., Philadelphia 44, Pa.—Instrumentation data sheet 2.9-18a describes a factory wired and piped control cubicle that reduces the charging of an alkaline digester to a push-button operation. A drawing and description of the operation of the control system, as well as an installation photograph, is included.

Clutches and Hydraulic Drives. Twin Disc Clutch Co., Racine, Wis.—This 32-page booklet designated as the "Cross Country" issue of Production Road describes almost 60 applications of friction clutches and hydraulic drives in as many types of machinery and equipment.

Jet Pumps. Penberthy Injector Co., 1242 Holden Ave., Detroit 2, Mich.—This 20-page bulletin (No. 512) gives specifications of jet pumps. Numerous drawings and tables are given. A section describing the installation, operation, and maintenance of jet pumps is included. Special jet pumps and other jet devices are illustrated and described. A list of the representative and end uses of the jet pump is also included.

Steel Castings. International Nickel Co., Inc., 67 Wall St., New York 5, N. Y.—This 32-page bulletin with over 100 illustrations reports on steel, cast to shape, as a reliable engineering material. Data on properties and applications of cast nickel steels of the constructional grades are classified by industrial fields. Low temperature properties, abrasion resistance, depth hardening and welding are discussed. Advantages and recommended specifications and compositions for typical service applications are given.

Steam Generators. Foster Wheeler Corp., 165 Broadway, New York 6, N. Y.—This 20-page catalogue (PG-51-2) describes package steam generators. It is divided into five sections: plant assembled steam generator, basic construction, range of capacities, control and instrumentation, and a partial list of purchasers. It also contains cutaway drawings, photographs, tables, and ratio charts.

Chemicals. National Aluminate Corp., 6216 W. 66th Place, Chicago 38, Ill.—This new 20-page Bulletin 55, "Nalco Chemicals and Services for Paper Mills," contains sections on antifoams, pitch control, sodium aluminate, mold proofing, slime control, and other Nalco products and services. An extensive list of questions and answers on slime control in paper mills is included, as well as many photographs.

Showers. Logan Emergency Showers, Inc., P. O. Box 111, Glendale, Calif.—A 6-page bulletin, No. 30, gives full specifications of emergency and decontamination showers. Photographs and diagrams are included.

Cylinders. Ledeen Mfg. Co., 1600 S. San Pedro St., Los Angeles 15, Calif.—This 4-page illustrated bulletin (No. 152), "Use a Cylinder and Save a Man," describes the application of Ledeen cylinders in such widely varied fields as chemical plants, oil refineries, plastics, concrete plants and lumber mills.

Scientific Instruments. Beckman Instruments, Inc., South Pasadena 73, Calif.—This 16-page booklet, No. 300, describes and illustrates the important features of 20 different instruments and basic accessory units. These instruments include pH meters, glass electrodes and accessory equipment; spectrophotometric equipment that operates in the visible and ultraviolet ranges; infrared spectrophotometric equipment, in addition to many other special instruments.

Pipe Fittings. The Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, Ohio—This new 76-page catalogue gives complete data on tube fittings and tube-to-pipe adapters, fabricating equipment, and pertinent data on engineering selection and installation. Photographs, drawings, and dimensional tables are included. The data section includes "how-to-do-it" photos and selection charts relating tube sizes to different variables.

Materials Handling. Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill.—This 16-page pocket-size booklet presents a method of determining rapidly basic materials handling requirements of a business. Subjects included in the guide are the relationship of materials handling to production, costs, shipping, and packing. A simple "score-keeping" system that determines if a firm needs further help in investigating ways to el..inate its problems is given.

Spray Nozzles. Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.—Information on non-clogging nozzles for cleaning materials is given in the 4-page folder (No. 2386). Shown are installation pictures and tables of dimensions and capacities.

Belt Conveyors. Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.—The uses, versatility, efficiency and typical installations of belt conveyors are described in a reprint of a talk given by Laurance O. Millard, assistant general sales manager.

Oil and Grease Seals. Garlock Packing Co., Palmyra, N.Y.—Complete information on the firm's Klozure oil and grease seals for bearings is available in a 100-page catalogue. Included are illustrations, typical applications, and a complete list of sizes and part numbers. Also described are Garlock's mechanical pressure seals for rotary shafts.

Welding Alloys. Eutectic Welding Alloys Corp., 40-40 172 St., Flushing, New York, N.Y.—This 16-page 1952 directory of electrodes and welding alloys contains photographs, data and technical information on a series of low temperature welding alloys. Also included is a chart of more than 100 of the firm's different welding alloys, their main uses, their bonding temperatures, and their tensile strengths.

Reagents and Fine Chemicals. Baker & Adamson Products, General Chemical Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N.Y.—This 264-page catalogue covers more than 1,000 high purity chemicals, including such facts as grades, strengths, maximum limits of impurities, etc., on all reagents. Also included are sections on storage and handling chemicals that require extra care, and on packaging.

Palletized Containers. American Box Co., 1900 W. 3rd St., Cleveland—This 4-page pamphlet describes wirebound palletized tote boxes. Included are illustrations, construction features, and specific applications.

Plug Valves. Porter Valve Div., H. K. Porter Co., Inc., 1150 N. Peoria St., Tulsa 1, Okla.—This 32-page descriptive catalogue covers the entire line of Porter lubricated plug valves. Cross-section and cut-away illustrations as well as line drawings are included. Sizes range from ½-inch to 12-inch.

Water Alarms. Northern Equipment Div., Continental Foundry & Machine Co., Erie 2, Pa.—Bulletin 493 (four pages) describes the Hi-Lo water alarm, which is based on the same thermostatic principle as the Copes feed water regulator.

Non-ionic Surfactants. Glyco Products Co., Inc., 26 Court St., Brooklyn 2, N.Y.—"Esters by Glyco" is a 24-page brochure giving tables of physical and chemical specifications of the non-ionic polyhydric alcohol fatty acid esters.

Adjustable Port Valves. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne and Windrim Aves., Philadelphia 44—Twelve-page catalogue 1800 covers the use of Honeywell diaphragm operators with North American adjustable port valves. Complete specification data are given covering valves for gas, air, oil, steam, and water regulation. Also included are mounting dimensions, material specifications, maximum pressures, and step-by-step ordering information.

Fluorescent Mercury Lamps. Westinghouse Electric Corp., 306 Fourth Ave., Pittsburgh 30, Pa.—This 4-page booklet gives detailed information on the firm's JH-1 fluorescent mercury lamps. Publication A-6007 gives recommendations as to applications.

Fork Lift Trucks. Towmotor Corp., 1226 E. 152nd St., Cleveland 10, Ohio—A recent pamphlet, "Towmotor-ize for Mobility," describes the engineering and design features of the firm's line, as well as a few typical applications.

Magnetic Separators. Eriez Mfg. Co., Erie, Pa.—Four-page bulletin 561 describes permanent non-electric magnetic separators for the paper industry. Included are construction and application data on five pieces of equipment, information on the selection of the proper separator, and a flow chart showing where in paper processing lines the magnetic separators can be installed.

Air-Operated Butterfly Valves. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne and Windrim Aves., Philadelphia 44—Twelve-page catalogue 1700 covers the use of Honeywell diaphragm operators with Continental butterfly valves. Complete specification data are given for both standard and heavy-duty pattern valves. Also included are material specifications, mounting dimensions, maximum pressure ratings, and selecting and ordering information.

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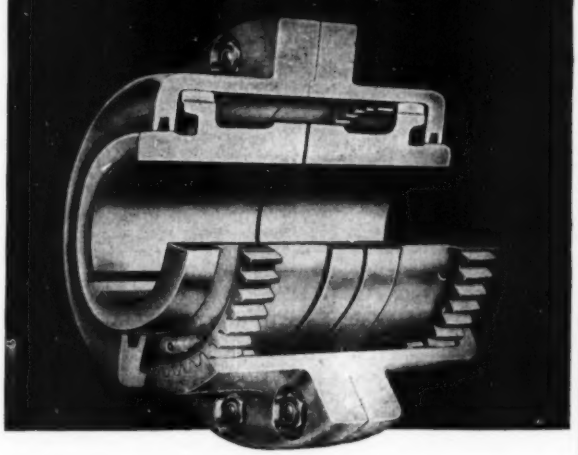

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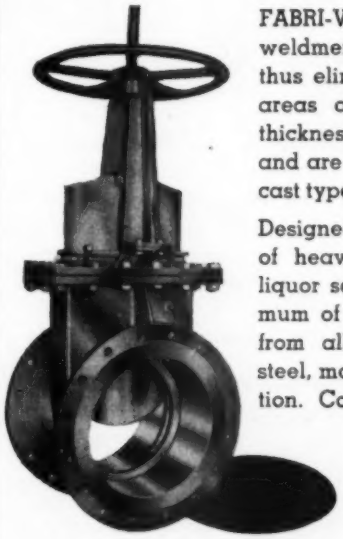

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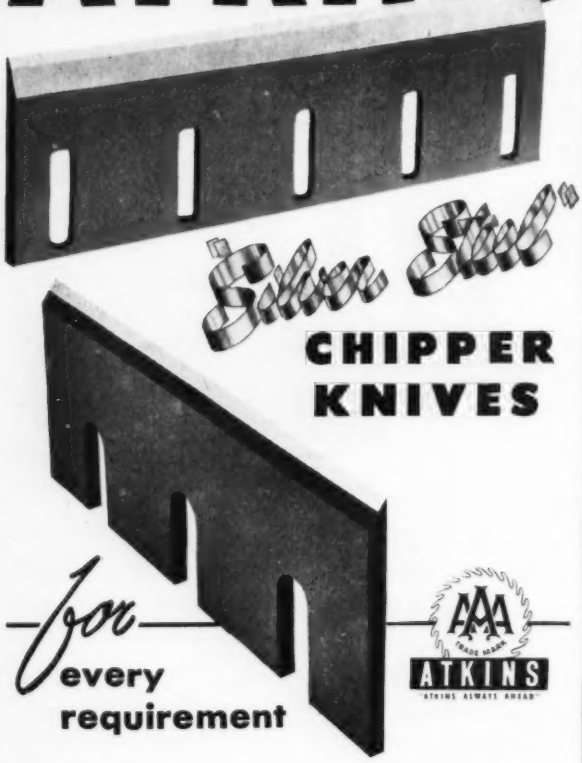

Leading pulp and paper mills have discovered that Atkins *"Silver Steel"* chipper knives *produce the most uniform chips!* But that's not all. They grind faster and easier. They stay sharp longer. They have minimum chipping. And they are available for any machine with any type of fastening you desire. It will pay you to get the facts—to compare results. Because, as a result, you'll specify ATKINS!

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Noted for long, continuous runs, Atkins *"Silver Steel"* paper knives are made of the finest steel, perfectly tempered. They are scientifically ground on precision machines to assure extreme accuracy! Atkins men in the field keep in constant touch with thousands of users—checking results, solving difficulties, seeking improvements. It keeps *Atkins Always Ahead!*

E. C. ATKINS AND COMPANY
402 South Illinois Street, Indianapolis 9, Indiana

Use—Don't Abuse—Fine Tools!

ATKINS

MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are OPS ceiling prices, cents per pound, delivered mills:

	per cwt.
Blue Overalls	14.50
Corduroy	8.00
Washables, No. 1	6.50
Percales	12.50
Light Prints, No. 1	11.50
Khaki Cuttings—	
Sun Tan	11.50
Mixed	8.00
New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.00
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	21.00
Grey	21.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.	
Roofing—		
No. 1	1.60 to	1.70
No. 2	1.10 to	1.20
No. 3 and 4	.95 to	1.05
Twos and Blues—		
Repacked	4.00 to	4.25
Thirds and Blues—		
Repacked	3.50 to	3.75
Miscellaneous	3.00 to	3.25
Whites, No. 1—		
Repacked	7.00 to	7.50
Miscellaneous	6.00 to	6.50
White, No. 2—		
Repacked	5.50 to	6.00
Miscellaneous	5.00 to	5.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.	
Bunny No. 1—		
Foreign	6.75 to	7.00
Domestic	7.00 to	7.25
Wool Tares—		
Light	8.50 to	9.00
Heavy	9.00 to	9.50
No. 1 Scrap Bagging	6.25 to	6.75
Manila Rope—		
No. 1 large	10.00 to	10.50
No. 1 small	9.00 to	9.50
Sisal Rope—		
No. 1 large	8.50 to	9.00
No. 1 small	8.00 to	8.50
New Burlap Cuttings	8.00 to	8.50
Jute Threads—		
Foreign (Nom.)	8.00 to	8.50
Domestic	8.00 to	8.50
Strings—		
No. 1 sisal	5.50 to	5.75
No. 2 sisal	5.00 to	5.25
Soft jute	5.25 to	5.50
Mixed	4.00 to	4.25

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	165.00—
Hard White, No. 1	130.00—
Soft White, one-cut	120.00—
Soft White, No. 1	110.00—
Soft White, Misc.	80.00—
Fly Leaf, No. 1	45.00—
Fly Leaf, Woody No. 1	40.00—
No. 2 Mixed Col. Woody	35.00—
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	38.00—
Mixed Books	26.00—
Ledger Stock—	
No. 1 White	90.00—
No. 1 Mixed (Colored)	70.00—
Manilas—	
New Env. Cuttings	110.00—
New Env. Cuts, One-Cut	—
Extra Manilas	60.00—
Manila Tab Cards, Free of Ground Wood	110.00—
Colored Tab Cards	85.00—
Kraft—	
New Envelope Cuttings	100.00—
Tripled Sorted No. 1 100%	45.00—
No. 1 Old Assorted	30.00—
News—	
White Blank	70.00—
Overissue	16.00—
No. 1 Folded	12.00—
Old Corrugated Containers	13.00—
New Jute Corrugated Cuts	19.00—
Mill Wrappers	12.00—
Box Board Chips	8.00—
No. 1 Mixed Paper	8.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—		
Lump, cwt.	4.55—	
Ground, cwt.	4.30—	
Powdered, cwt.	4.70—	
Blanc Fixe—		
Pulp, bulk, ton	90.00—	
Dry, barrels	95.00—	
Bleaching Powder—		
Drums, cwt.	5.00 to	6.00
Casein (Domestic Standard)		
20-30 mesh (bags), lb.		
80-100 mesh (bags), lb.	29.00—	
Argentine, lb.	28.00 to	30.00
China Clay—		
Domestic Filler Bulk (mine) ton	10.00 to	15.00
Domestic Coating Bulk (mine) ton	15.00 to	25.00
Imported (ship side) Bulk (lump) ton	22.00 to	30.00
Chlorine—		
Tanks cars (wks) cwt.	2.70—	
Gelatine (silicin), lb.	1.25 to	1.35
Glyc. (C.P.) drums, lb.	54.25 to	54.75
Litharge, powd. bbl. lb.	20.65 to	21.65
Rosin (Gum)—	New York, per 100 lbs.	
E	8.60—	
F	8.60—	
G	8.60—	
WW	9.60—	
Rosin (Wood), carlots, F.O.B. South	5.20 to	5.30

MARKET QUOTATIONS

Salt Cake—
Dom. bulk (wks) ton..... 17.00 to 23.00
Imp. bulks on dock—
(Atl. ports) ton (Nom.) 25.00—

Soda Ash—
Bulk (works) cwt..... 1.20—
Paper bags, cwt..... 1.60—

Soda (Caustic)—
Solid drums, cwt..... 3.35 to 3.40
Ground and flake, drums, cwt. ..... 3.75 to 3.85

Sodium Silicate—
60 deg. 55 gal. drums, (works) cwt. ..... 1.70 to 1.80
40 deg. 35 gal. drums, (works), cwt. ..... 1.40 to 1.50

Starch—
Pearl, 140 lb. bags, cwt. 6.44—
Pearl, barrels, cwt..... 6.44—
Paper (Sp.) bags, cwt... 6.44—
Powdered, barrels, cwt... 6.65—

Sulphur (Crude)
(Mine) bulk, long ton.... 21.00 to 22.00

Talc—
Dom. 100 lb. bags (mine) ton ..... 25.00 to 28.00
Canadian ..... 35.00 to 45.00

Titanium Dioxide—
Barium Pig. bbls., lb..... .21 to .21½
Calcium Pig. bbls., lb..... .21 to .21½
Zinc Sulphide, bbls., lb.... 11.50 to 11.75

WOOD PULP

The following are OPS ceiling prices on domestic wood pulp, dollars per short air dry ton delivered consuming mills including the basic maximum freight allowances as provided:

Bleached sulphite .....140.00—
Unbleached sulphite .....132.50—
Bleached sulphate .....145.00—
Semi-bleached sulphate .....140.00—
Unbleached sulphate 132.50
Bleached soda .....140.00—
Ground wood ..... 92.50—
Sulphite screenings ..... 72.50—
Sulphate screenings ..... 67.50—
Ground wood screenings..... 60.00—
Unbleached sulphate sideruns .....132.50—
Standard news print siderun ..... 92.50—

OPS ceiling prices on European wood pulp, dollars per short air dry ton, on dock at American Atlantic ports, follow:

Bleached sulphite .....225.00—
Bleached sulphate .....230.00—
Unbleached sulphite .....200.00—
Unbleached sulphate .....200.00—

PAPER

Boards—
OPS ceiling prices (CPR 108) per ton, delivered consumer's mill, 10 tons or more:
Plain chip.....105.00—
News vat lined chip.....107.50—
Filled news.....110.00—
Solid news.....112.50—
White vat lined chip.....142.50—
Chip tube and can stock....110.00—
Single manila lined chip....147.50—
Single jute lined chip.....145.00—
White patent coated:
.020 .....175.00—
.018 .....177.50—
.016 .....180.00—

Book Paper—
OPS ceiling prices (CPR 106) per cwt.:

Coated two sides

70 lb. No. 2 enamel, 25x38-500, trimmed 4 sides....	4 cases	$17.25
	Carloads	$16.30
45 lb. enamel, 25x38-500, trimmed 4 sides.....	4 cases	$13.05
	Carloads	$12.10

Uncoated

55 lb. No. 2 offset, 25x38-500, trimmed 4 sides.....	4 cases	$14.80
	Carloads	$13.85
50 lb. A Grade English Finish, 25x38-500, untrimmed	4 cases	$14.05
	Carloads	$13.10
20 lb. envelope, 17x22-500, untrimmed	Carloads	$12.40
16 lb. tablet, 17x22-500	Carloads	$11.35

Rag Content Bond—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Extra 100% rag.....	57.50	58.50
100% rag.....	49.50	50.50
75% rag.....	38.00	39.00
50% rag.....	29.50	30.50
25% rag.....	24.00	25.00

Rag Content Ledger—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

Extra 100% rag.....	58.50
100% rag.....	50.50
85% rag.....	42.00
75% rag.....	39.50
50% rag.....	30.50
25% rag.....	25.00

Sulphite Bond—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

	17 lbs. or heavier	16 lbs.
Air dry bond (Watermarked)	20.00	21.00
No. 1 bond (M.F. watermarked)	15.50	16.20
No. 2 bond (M.F. watermarked)	14.90	15.60
Plain bond (M.F. unwatermarked)	14.00	14.60

Sulphite Ledger—
OPS ceiling prices (CPR 91) per cwt., f.o.b. mill:

No. 1, M.F. watermarked.....	16.50
No. 2, M.F. watermarked.....	15.90
Plain, M.F. unwatermarked.....	15.00

Glassine (f.o.b. mill)—
OPS base ceilings (CPR 76):

	per cwt.
25 lb. base No. 1 bleached glassine	22.50—
25 lb. base No. 1 bleached greaseproof	20.00—

News—

	per ton
Rolls, Standard (Contract)	114.00 to 116.00
Rolls (Spot).....	(Nominal)
Sheets	130.00—

Tissues (Carlots)—

	per ream
White No. 1.....	2.25—
White No. 2.....	1.75—
Bleached Anti-Tarnish.....	—
Colored	2.20—
Anti-Tarnish Kraft	2.10—
Manila	2.20—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.....	.90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs.....	.90—
Toilet, Bleached (M shts.) per cs.....	10.00—
Toilet, Unbleached (M shts.) per cs.....	8.00—

Towels

	per case
Bleached	6.80—
Unbleached	5.90—

Wrappings (Kraft)—
OPS ceilings, per cwt., 50 lb. base weight:

	per cwt.
Standard wrapping	7.75—
Butchers, counter rolls.....	8.25—
Standard bag, mill rolls....	7.50—
Shipping sack, mill rolls....	7.75—
Gumming, mill rolls.....	8.00—
Asphalting, mill rolls.....	7.75—
Envelope, mill rolls.....	9.25—

Wrappings (Sulphite and Bleached Kraft)—
(Rolls, f.o.b. mill)

	per cwt.
Bleached Papers—	
M.F. & M.G. Waxing, 20 lb. (carloads only) (10,000 lb.).....	—
Drug wrapp., 35 lb...	—
Unbleached Papers	
Com. Gr. Butch. 40 lb.	
No. 1 Butchers.....	—
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.....	—
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.....	—
Steam Finish, 50 lb...	—
Water Finish, 50 lb...	—
Manilas—	
Envp. Mla., Sub. 16-40 (No. 1).....	—
Env. Mla., Sub. 16-28 (No. 2).....	—
Envp. Mla. (Prices based on large sheets untrimmed ream marked, in bdls.).....	—
Wrapp. Mla. 35 lb. up—	
No. 1.....	—
No. 2.....	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B-20 lb.....	—
Grade A-22 lb.....	—

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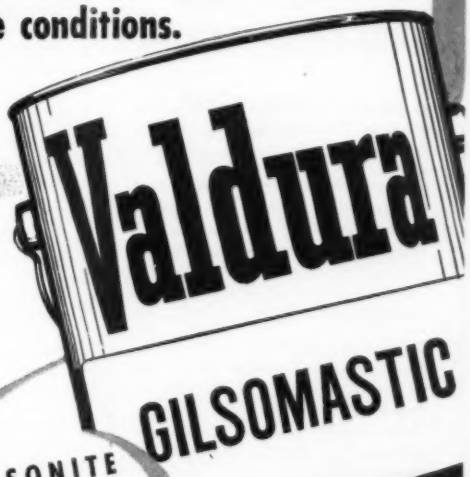

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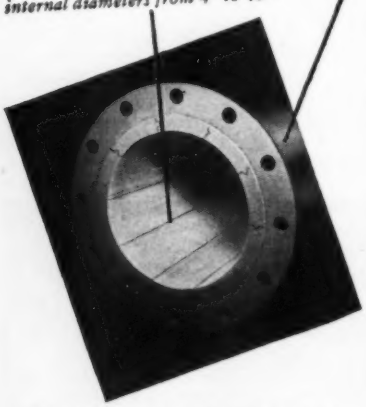

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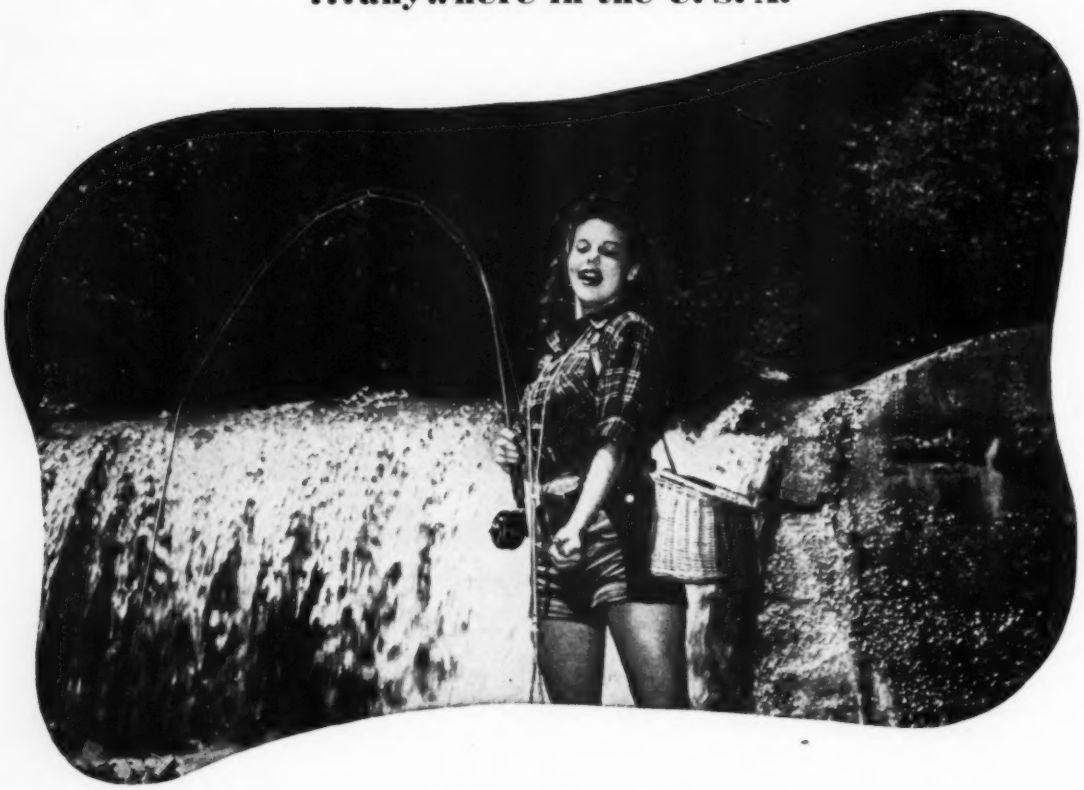


This is an experiment, folks! Knowing how many of you men and women love to fish, the makers of Tenax Felts are giving you something *extra* to fish for . . . 46 worthwhile prizes. We sincerely hope this contest will be welcomed so enthusiastically that it can become an annual event.

GET ENTRY BLANKS AT YOUR OWN MILL NOW

See your bulletin board or ask your mill foreman for easy contest rules, official entry blanks and list of fish for which prizes will be awarded. Contest starts April 1st—ends midnight, October 1st, 1952. Get started early—because in this contest amateurs can win as easily as experts. First, second and third prizes will be awarded in *each* of 15 separate classes—for the heaviest of 15 different varieties of fish, from perch and sunfish to muskalonge! In addition, you may win the National Grand Prize! So . . . let's go fishin'!

THESE PRIZES MUST BE WON!

NATIONAL GRAND PRIZE

10 H. P. JOHNSON OUTBOARD MOTOR

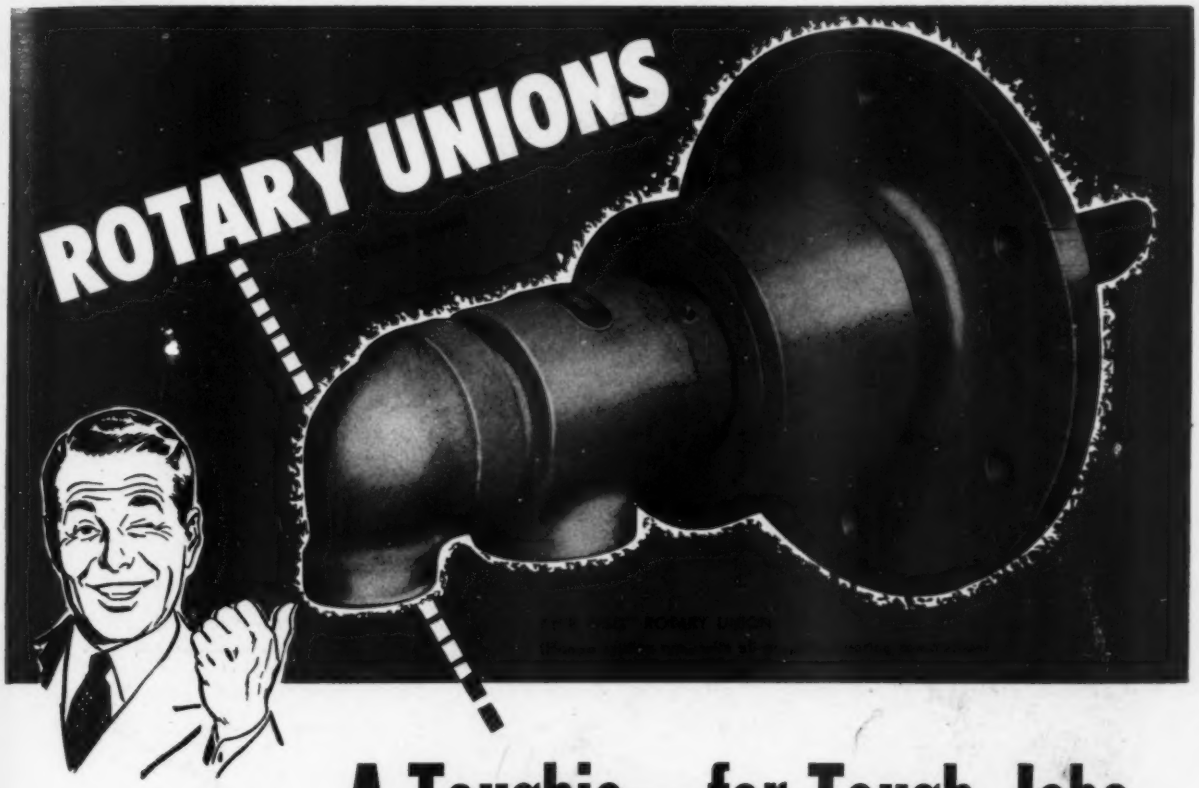
For the fish nearest the weight of all-time record fish of same variety, as listed in FIELD & STREAM RECORD BOOK.

15—1st Prizes.....$100 Savings Bond
(1 each variety of fish listed on official entry blank)

15—2nd Prizes .....$50 Savings Bond
(1 each variety of fish)

15—3rd Prizes.....$25 Savings Bond
(1 each variety of fish)

LOCKPORT FELT CO., NEWFANE, N. Y.



A Toughie—for Tough Jobs

This is the ROTARY UNION designed especially to give perfect service at the high speeds, high pressures, wide extremes in temperatures and the continuous heavy duty service required on revolving drying equipment in the paper industry.

This unit is flanged directly to the journal and revolves with the drum itself. Its heavy-duty, low-friction, metal-backed graphite bearing requires no lubrication. Its two point syphon support assures better alignment of the syphon pipe, eliminates excessive strain on syphon pipe threads, and prevents wearing through and falling off of syphon pipes.

SMOOTH SEALING FOR OVER 18 YEARS

The Type "FSG" ROTARY UNION will solve the toughest problems on revolving paper mill equipment. Contact our nearest office for expert engineering consultation or write Department 3P for our latest catalog.

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THE BIG STRETCH

Here on the "Stretching Table" is a Fourdrinier wire — getting its final inspection before preparation for shipment. Yes, it's a Big Stretch all around!

As your own dynamic industry stretches its capacity, so Eastwood-Nealley is increasing its own capacity to keep fully abreast of the great pulp and paper industry.

We are producing more and larger Fourdrinier wires on newer, more modern equipment in our effort to serve you better.

EASTWOOD WIRES MADE FROM CENTRIFUGALLY CAST ALLOYS

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